

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2003-073403

(43)Date of publication of application : 12.03.2003

(51)Int.Cl.

C08B 37/08
A23K 1/16
A23L 1/221
A23L 1/305
A23L 1/308
A23L 2/52
A61K 7/00
A61K 47/36
A61K 47/42
C08B 37/00
C08B 37/10

(21)Application number : 2001-264474

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(22)Date of filing : 31.08.2001

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(54) MUCOPOLYSACCHARIDE AND/OR COLLAGEN

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a mucopolysaccharide- and/or a collagen-containing extract in which an unpleasant odor is reduced or abolished at a low cost, a method for producing a mucopolysaccharide and/or a collagen, a mucopolysaccharide- containing extract, a collagen-containing extract, a mucopolysaccharide and/or a collagen obtained by the method and a food, a beverage, a seasoning, a feed, a cosmetic or a medicine containing them.

SOLUTION: The extract characterized by containing a step for extracting a mucopolysaccharide source and/or a collagen source in the presence of a reducing substance, the method for producing the mucopolysaccharide and/or the collagen, the extract, the mucopolysaccharide and/or the collagen obtained by the method and the food, the beverage, the seasoning, the feed, the cosmetic or the medicine are provided. Also, a novel mucopolysaccharide- and/or a collagen-containing extract having a reduced protein content is provided by using the method in combination with a process with a protease.

LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision]

of rejection]

[Date of extinction of right]

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CLAIMS

[Claim(s)]

[Claim 1] The manufacture approach of the mucopolysaccharide characterized by including the process which extracts the source of a mucopolysaccharide, and/or the source of a collagen under existence of the reducibility matter, and/or a collagen content extract.

[Claim 2] The manufacture approach of the mucopolysaccharide according to claim 1 which are one or more reducibility matter chosen from the group which the reducibility matter becomes from an ascorbic acid, an ascorbic-acid salt, erythorbic acid, erythorbic acid, a cysteine, and a glutathione, and/or a collagen content extract.

[Claim 3] The manufacture approach of the mucopolysaccharide according to claim 1 or 2 characterized by including the process extracted with warm water or a solvent under existence of the reducibility matter, and/or a collagen content extract.

[Claim 4] A mucopolysaccharide given in claim 1 characterized by carrying out an extract in 30-130 degrees C for 5 minutes to 32 hours - 3 any 1 terms, and/or the manufacture approach of a collagen content extract.

[Claim 5] A mucopolysaccharide given in claim 1 characterized by adding a protease in an extract process and/or the source of a mucopolysaccharide and/or the source of a collagen are the sources of a mucopolysaccharide and/or the sources of a collagen by which protease processing was carried out - 4 any 1 terms, and/or the manufacture approach of a collagen content extract.

[Claim 6] The manufacture approach of a mucopolysaccharide content extract given in claim 1 characterized by a mucopolysaccharide content extract containing one sort or two sorts or more of glycosaminoglycans - 5 any 1 terms.

[Claim 7] The manufacture approach of a mucopolysaccharide content extract according to claim 6 that glycosaminoglycan is chondroitin sulfate.

[Claim 8] The mucopolysaccharide and/or collagen content extract which are obtained by the mucopolysaccharide given in claim 1 - 7 any 1 terms, and/or the manufacture approach of a collagen content extract.

[Claim 9] The manufacture approach of of the mucopolysaccharide and/or collagen which are characterized by including the process which extracts the source of a mucopolysaccharide, and/or the source of a collagen under existence of the reducibility matter.

[Claim 10] The manufacture approach of of the mucopolysaccharide according to claim 9 and/or collagen which are one or more reducibility matter chosen from the group which the reducibility matter becomes from an ascorbic acid, an ascorbic-acid salt, erythorbic acid, erythorbic acid, a cysteine, and a glutathione.

[Claim 11] The manufacture approach of of the mucopolysaccharide according to claim 9 or 10 and/or collagen which are characterized by including the process extracted with warm water or a solvent under existence of the reducibility matter.

[Claim 12] A mucopolysaccharide given in claim 9 characterized by carrying out an extract in 30-130 degrees C for 5 minutes to 32 hours - 11 any 1 terms, and/or the manufacture approach of a collagen.

[Claim 13] A mucopolysaccharide given in claim 9 characterized by adding a protease in an extract process and/or the source of a mucopolysaccharide and/or the source of a collagen are the sources of a mucopolysaccharide and/or the sources of a collagen by which protease processing was carried out - 12 any 1 terms, and/or the manufacture approach of a collagen.

[Claim 14] The manufacture approach of a mucopolysaccharide given in claim 9 whose mucopolysaccharide is glycosaminoglycan - 13 any 1 terms.

- [Claim 15] The manufacture approach of a mucopolysaccharide according to claim 14 that glycosaminoglycan is chondroitin sulfate.
- [Claim 16] The mucopolysaccharide and/or collagen which are obtained by the mucopolysaccharide given in claim 9 - 15 any 1 terms, and/or the manufacture approach of a collagen.
- [Claim 17] The food characterized by containing a mucopolysaccharide according to claim 8, a collagen content extract, a mucopolysaccharide according to claim 16, and/or a collagen, a drink, a seasoning, or feed.
- [Claim 18] The charge of makeup characterized by containing a mucopolysaccharide according to claim 8, a collagen content extract, a mucopolysaccharide according to claim 16, and/or a collagen as an active principle.
- [Claim 19] The remedy characterized by containing a mucopolysaccharide according to claim 8, a collagen content extract, a mucopolysaccharide according to claim 16, and/or a collagen as an active principle.
- [Claim 20] The mucopolysaccharide and/or collagen content extract with which it is the mucopolysaccharide and/or collagen content extract which are obtained by the mucopolysaccharide given in claim 1 - 7 any 1 terms, and/or the manufacture approach of a collagen content extract, and the unpleasant smell of no-odor-izing or the source of a mucopolysaccharide, and/or the source origin of a collagen was reduced.
- [Claim 21] The mucopolysaccharide and/or collagen by which it is the mucopolysaccharide and/or collagen which are obtained by the mucopolysaccharide given in claim 9 - 15 any 1 terms, and/or the manufacture approach of a collagen, and the unpleasant smell of no-odor-izing or the source of a mucopolysaccharide, and/or the source origin of a collagen was reduced.
- [Claim 22] The no odor nature mucopolysaccharide and/or collagen content extract which are obtained by the mucopolysaccharide given in claim 1 - 7 any 1 terms, and/or the manufacture approach of a collagen content extract.
- [Claim 23] The no odor nature mucopolysaccharide and/or collagen which are obtained by the mucopolysaccharide given in claim 9 - 15 any 1 terms, and/or the manufacture approach of a collagen.
- [Claim 24] The achromatism mucopolysaccharide and/or collagen content extract which are obtained by the mucopolysaccharide given in claim 1 - 7 any 1 terms, and/or the manufacture approach of a collagen content extract.
- [Claim 25] The low protein mucopolysaccharide and/or collagen content extract which are obtained by the manufacture approach of a mucopolysaccharide according to claim 5 and/or a collagen content extract.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention is simple and relates to the mucopolysaccharide obtained by the manufacture approach of no odor nature and achromatism or the mucopolysaccharide and/or collagen content extract with which the unpleasant smell of the raw material origin was reduced, a mucopolysaccharide, and/or a collagen, and the manufacture approach concerned and/or a collagen content extract, a mucopolysaccharide and/or a collagen, the food containing these, a drink, a seasoning, feed, the charge of makeup, or a remedy. Moreover, this invention relates to the new mucopolysaccharide and/or collagen content extract of achromatism, and/or non-bromination of the new protein content was reduced and carried out.

[0002]

[Description of the Prior Art] A mucopolysaccharide means the polysaccharide obtained from the animal in a wide sense. As a raw material of a mucopolysaccharide, it is the cartilage of land animals, such as fishery animals, such as a shark, a whale, and a sea cucumber, a cow, a pig, a horse, and a hen, UROKO of a hide and a fish, etc., and has the characteristic unpleasant smell of the raw material origin with some purity of the obtained mucopolysaccharide.

[0003] The method of manufacturing a mucopolysaccharide content extract is divided roughly into the enzymatic process which makes an extract easy by carrying out decomposition clearance of the protein which adds the alkaline process extracted by lye from the raw material, the neutral salt method extracted with neutral salt liquid, and a protease, and lives together. In any case, pretreatment which removes impurity beforehand is required. Moreover, in an alkaline process, there is a fault into which a mucopolysaccharide is decomposed with alkali. By the neutral salt method, although decomposition of the mucopolysaccharide by the chemical is not produced, there is a fault more than which an extract takes long duration and the elution to a proteinic extract increases. In enzymatic process, in order to warm, there is a fault in which a lipid is eluted. In enzymatic process, since especially clearance of a lipid is complicated, in applying to mass production method, there is a difficulty practically. In view of this, after adding water, maintain a raw material at an elevated temperature, and the approach "JP,49-26234,A" and strong alkaline protease which extract a mucopolysaccharide are made to act, and the method "JP,50-8829,A" of performing deproteination to an extract and coincidence is learned. However, the mucopolysaccharide content extract obtained using these approaches has an enough process about neither the smell of the raw material origin [**** / being complicated], nor coloring, a protein content, etc.

[0004] Glycosaminoglycan is a kind of a mucopolysaccharide, it consists of repeat disaccharides, and one of disaccharides always consists of D-glucosamine or D-galactosamine, and hyaluronic acid, chondroitin sulfate, chondroitin, keratan sulfates I and II, heparin, a heparin sulfuric acid, dermatan sulfate, etc. are known.

[0005] Chondroitin sulfate is a kind of the mucopolysaccharide obtained from the mucus nature secretion liquid of a fish or an animal, it exists in the condition (a mucopolysaccharide and protein complex) of having combined with protein in the body as a substrate component of connective tissue, such as a cartilage, a bone, a cornea, a lens, a blood vessel wall, and the skin, and chondroitin sulfate especially occupies 20 - 40%w/w of dry weight by the cartilage. Moreover, for chondroitin sulfate, N-acetyl-D-galactosamine, D-glucuronic acid, or L-iduronic acid is beta. - Make into a configuration unit the disaccharide which carried out the glycosidic linkage. The chondroitin 4-sulfuric acid which made the basic frame the polysaccharide of molecular weight 10,000-80,000, and the sulfuric-acid radical combined with the 4th place of C of N-acetyl-D-galactosamine (it is also called a chondroitin sulfate-A type), Or the chondroitin 6-sulfuric acid which the sulfuric-acid radical combined with the 6th place of C (it is also called a chondroitin sulfate-C type), The dermatan sulfate (it is also called a chondroitin

sulfate-B type) which the sulfuric-acid radical combined with the 4th place of C of N-acetyl-D-galactosamine including L-iduronic acid instead of D-glucuronic acid is known widely. As for each of these, about one mol (6.4% w/w) of sulfur is contained per configuration unit.

[0006] Chondroitin sulfate makes metabolism lubrication for the water retention under organization of an animal and the body by the scale and this, is presumed to be what has achieved the activation function of a cell, and is widely used as a health food raw material. What is marketed as a food grade in the current commercial scene has many things containing 20% of chondroitin sulfate, and 40%, the component of unpleasant smell of a characteristic **** component or an animal, such as a processing smell and a heating smell, remains [a raw material] for fishes or the animal origin, and if little direction of fishes, and animal protein and a peptide may also be desirable and twists them in activity eye from taste, a product of high content of chondroitin sulfate is also desired.

[0007] The method of on the other hand reducing an unpleasant smell peculiar to a raw material by refining chondroitin sulfate to a high grade is also learned. For example, after carrying out protease processing and preparing by alcoholic fractionation after an alkali extract, the chondroitin sulfate of the high grade by which non-bromination was carried out can be obtained by refining with a chromatography. However, this approach is complicated and the manufacture approach of chondroitin sulfate that the unpleasant smell of no-odorizing [that cost is also simple from this thing and low cost] or the raw material origin was reduced is desired.

[0008] A collagen is a main protein component which constitutes the connective tissue of an animal, and are configuration protein, such as epidermal tissues, such as a cartilaginous tissue, an organization of those other than a cartilage, and the skin. Molecular-weight about 100,000 polypeptide chain founds Rix to 3 counterclockwise twining, and these three chains of a collagen molecule settle further, and it takes the right hand wind double helical structure. Molecular weight is cylindrical structure with a die length [about 300,000 / of 300nm], and a diameter of 1.5nm, and the cylindrical molecule of these double helical structures becomes a bundle regularly in the direction of die length, and it builds fibril. This is assembling peculiar higher order structure for every organ further. Moreover, it is also known that a collagen will be hard to be decomposed by the usual protease. In dermis, about 75% of the dry weight of the whole skin is formed. As the physiological function, cells are tied, making the environment where a cell tends to work is known, and the cosmetics effectiveness, the improvement effect of aging change of the skin, etc. are known.

[0009] [Problem(s) to be Solved by the Invention] In the raw material (source of a mucopolysaccharide) of a mucopolysaccharide, the component in the living body is contained variously, and, as for these, a characteristic stinking component and a taste component are eluted to a liquid part in a water alkali solution, neutral salt, and protease processing. Moreover, besides this, by an extract or heat-treatment at the time of sterilization, coloring increases or a heating smell generates at the reaction between components.

[0010] The physiological function of chondroitin sulfate Capacity accommodation and balance of water of extracellular fluid, Migration of the ion of extracellular fluid, accommodation, occification and the contribution to mineralization, carrying out smoothly of a joint organization, In order to know fat blood serum *****, a blood coagulation inhibition operation, cornea transparency maintenance, infection prevention, etc. and to fully demonstrate these physiological functions as food, a drink, feed, the charge of makeup, or a medicinal active principle, Development [that it is simple and low cost] of the manufacture approach of high grade chondroitin sulfate that the unpleasant smell of the raw material origin was reduced or non-bromination was carried out is desired.

[0011] The object of this invention is to offer the food containing the low cost mucopolysaccharide obtained by the manufacture approach of the new mucopolysaccharide and/or new collagen content extract of no odor nature, a mucopolysaccharide, and/or a collagen, and the manufacture approach concerned or an unpleasant smell was reduced and/or a collagen content extract, a mucopolysaccharide and/or a collagen, and these, a drink, a seasoning, feed, the charge of makeup, or a remedy. Moreover, the object of this invention is to offer the new mucopolysaccharide and/or collagen content extract of achromatism of no odor nature with which the protein content was reduced.

[0012] [Means for Solving the Problem] If this invention is outlined, invention of the 1st of this invention relates to the manufacture approach of the mucopolysaccharide characterized by including the process which extracts the source of a mucopolysaccharide, and/or the source of a collagen under existence of the reducibility matter, and/or a collagen content extract.

- [0013] Invention of the 2nd of this invention relates to the manufacture approach of of the mucopolysaccharide and/or collagen which are characterized by including the process which extracts the source of a mucopolysaccharide, and/or the source of a collagen under existence of the reducibility matter.
- [0014] In invention of the 1st and the 2nd of this invention, one or more reducibility matter chosen from the group which consists of an ascorbic acid, an ascorbic-acid salt, erythorbic acid, erythorbic acid, a cysteine, and a glutathione as reducibility matter is illustrated. Moreover, as the extraction condition, warm water or a solvent can extract and an extract can be carried out in 30-130 degrees C for 5 minutes to 32 hours. Moreover, the source of a mucopolysaccharide and/or the source of a collagen where protease processing of the source of a mucopolysaccharide and/or the source of a collagen was carried out can also be used, and a protease can also be added in an extract process. Moreover, in invention of the 1st and the 2nd of this invention, as a mucopolysaccharide, one sort or two sorts or more of glycosaminoglycans are illustrated, and chondroitin sulfate is suitably illustrated as glycosaminoglycan.
- [0015] Invention of the 3rd and the 4th of this invention relates to the mucopolysaccharide manufactured by invention of the 1st or the 2nd of this invention, respectively and/or a collagen content extract or a mucopolysaccharide, and/or a collagen.
- [0016] Invention of the 5th of this invention relates to the food containing the mucopolysaccharide and/or collagen of invention of the 6th of the mucopolysaccharide of invention of the 3rd of this invention, a collagen content extract, and/or this invention, a drink, a seasoning, or feed.
- [0017] Invention of the 6th of this invention relates to the charge of makeup which contains the mucopolysaccharide and/or collagen of invention of the 6th of the mucopolysaccharide of invention of the 3rd of this invention, a collagen content extract, and/or this invention as an active principle.
- [0018] Invention of the 7th of this invention relates to the remedy which contains the mucopolysaccharide and/or collagen of invention of the 6th of the mucopolysaccharide of invention of the 3rd of this invention, a collagen content extract, and/or this invention as an active principle.
- [0019] Invention of the 9th of this invention relates to the mucopolysaccharide and/or collagen by which the unpleasant smell of no-odor-izing obtained by invention of the 2nd of this invention or the source of a mucopolysaccharide, and/or the source origin of a collagen was reduced, concerning the mucopolysaccharide and/or collagen content extract with which the unpleasant smell of no-odor-izing or the source of a mucopolysaccharide where invention of the 8th of this invention is obtained by invention of the 1st of this invention, and/or the source origin of a collagen was reduced.
- [0020] Invention of the 11th of this invention relates to the no odor nature mucopolysaccharide and/or collagen which are obtained by invention of the 2nd of this invention, concerning the no odor nature mucopolysaccharide and/or collagen content extract with which invention of the 10th of this invention is obtained by invention of the 1st of this invention.
- [0021] Invention of the 11th of this invention relates to the new achromatism mucopolysaccharide and/or collagen content extract which are obtained by invention of the 1st of this invention.
- [0022] In the manufacture approach of invention of the 1st of this invention, invention of the 12th of this invention relates to the new mucopolysaccharide and/or new collagen content extract which are obtained by the manufacture approach of of the mucopolysaccharide and/or collagen content extract with which the protease was added in the extract process and with which protein was reduced, moreover protease processing of the source of a mucopolysaccharide and/or the source of a collagen was carried out.
- [0023]
- [Embodiment of the Invention] Although the source of a mucopolysaccharide used by this invention will not have especially definition if it can be used as a raw material of a mucopolysaccharide, cartilages, hides, etc. of a land animal, such as fishery animals, such as a whale, a shark, and a sea cucumber, a cow, a pig, a horse, a sheep, and a hen, are illustrated. Moreover, UROKO of fishes can also be used. Furthermore, the mucopolysaccharide of the mucopolysaccharide inclusion and marketing by which extract processing was carried out once can also be used as a source of a mucopolysaccharide of this invention.
- [0024] Although there will be especially no definition if it can be used as a raw material of a collagen as a source of a collagen in this invention, the hide of mammalian, a bone, a cartilage, a bone of birds, etc. can be used, for example. Moreover, in this invention, the collagen inclusion extracted once and a commercial collagen are also contained in the source of a collagen of this invention.
- [0025] the raw material which is a raw material of a mucopolysaccharide and is used also as a raw material of a collagen, for example, a shark, -- when a cartilage is used as a raw material and it extracts by the extract

approach of this invention, or when it mixes, the source of a mucopolysaccharide, for example, a commercial mucopolysaccharide, and the source of a collagen, for example, a commercial collagen, it considers as a raw material and it extracts by the extract approach of this invention, the extract containing both a mucopolysaccharide and a collagen can be obtained. Naturally these are also included by the mucopolysaccharide and collagen content extract of this invention.

[0026] Although there is nothing, especially definition may perform mere rinsing, the torrefaction, roast, and steaming according to the usual approach, and may perform protease processing like the after-mentioned, and can also perform pretreatment before an extract combining these. although there is especially no definition as a configuration of the source of a mucopolysaccharide after pretreatment — the shape of powder and a flake, a split, a flake, and a cube cut — or what is necessary is to come out as it is and just to use it

[0027] Although there is especially no definition, the reducibility matter used for this invention has that desirable with which edible is presented, and it is suitable for it to use one or more chosen from the group of an ascorbic acid, an ascorbic-acid salt, erythorbic acid, erythorbic acid, a cysteine, and a glutathione from the effect affect the effectiveness and the taste of reduction. Here, an ascorbic-acid salt and erythorbic acid should just be salts, such as sodium, a potassium, and calcium. the liquid which uses the amount of the reducibility matter to be used for an extract — receiving — 0.005 – 5.0%w/w — it is 0.01 – 2.0%w/w preferably.

[0028] Moreover, when using a protease in the extract from the source of a mucopolysaccharide, and/or the source of a collagen The source of a mucopolysaccharide and/or the source of a collagen which carried out protease processing beforehand as pretreatment as mentioned above under reducibility matter existence Hot water or the approach of carrying out solvent extraction, Which approach of hot water, the approach of carrying out solvent extraction, or the approach that combined these is also employable, carrying out protease processing of the source of a mucopolysaccharide, and/or the source of a collagen under reducibility matter existence. Or by the approach concerned The new mucopolysaccharide and/or new collagen content extract which were reduced or removed, a proteinic mucopolysaccharide, and/or a proteinic collagen can be obtained.

[0029] The source of a mucopolysaccharide and/or the unpleasant smell of the source origin of a collagen, and the stinking component and coloring component of the extract down-stream-processing origin are reduced or removed, protein is also reduced or removed further, and the mucopolysaccharide of this invention and/or collagen content extract from which protein was reduced or removed, a mucopolysaccharide, and/or a collagen do not break down the flavor of other mixture as a raw material raw material, and are useful also especially as food, a drink, a seasoning, feed, the charge of makeup, or a medicinal raw material. Moreover, since the protein content which can serve as allergen is reduced, the mucopolysaccharide and/or collagen content extract with which such a protein content was reduced, the mucopolysaccharide, and/or the collagen are useful also especially as the food which made the allergic response avoid, a drink, a seasoning, feed, the charge of makeup, or a medicinal raw material.

[0030] There is especially no definition, as for the protease used for protease processing, the thing of an animal, vegetation, and the microorganism origin can be used, for example, as a thing of the animal origin, a chymotrypsin, a trypsin, a pepsin, or chymosin is mentioned, as a thing of the vegetable origin, a papain or bromelain is mentioned and the acidity of bacteria, an Actinomyces, an aspergillus, mold, or a basidiomycete, neutrality, and alkaline protease are mentioned as a thing of the microorganism origin. Moreover, it is included by the protease here, and they can be used for these proteases by collagenase, esterase, and keratinases, choosing according to the class of the extract to manufacture, a mucopolysaccharide, and/or collagen. Moreover, at least one or more and the protease of carboxypeptidase, aminopeptidase, lipase, glucoamylase, alpha-amylase, a pectinase, a cellulase, and hemicellulase may be used together.

[0031] the source of a mucopolysaccharide used although especially definition does not have the amount of the protease used by considering the source of a mucopolysaccharide, and/or the source of a collagen as pretreatment when carrying out protease processing, and/or 0.01 – 10%w/w per source dried food of a collagen — it is 0.05 – 5%w/w preferably. Although there will be especially no definition if, as for a solvent, an enzyme can act, according to properties, such as solubility of a mucopolysaccharide and a collagen, it is suitably chosen by the mucopolysaccharide and/or the collagen content extract, the target mucopolysaccharide, and/or target collagen of this invention, for example, water or an ethyl alcohol water solution (ethyl alcohol concentration, 0 – 50%v/v) can use it suitably by them. Moreover, although especially definition does not have operative temperature by the activity enzyme and it is 30–120 degrees C, its 50–100 degrees C are desirable on an activity. Although reaction time can be suitably set up with reaction temperature, it is 0.2 – 24 hours preferably for 0.1 to 32 hours.

[0032] The weight of the source of a mucopolysaccharide to the sum total weight of the liquid which uses the extraction condition of this invention for an extract, the source of a mucopolysaccharide, and/or the source of a collagen, and/or the source of a collagen is 1 – 20%w/w from the point of a flavor under 0.5 – 50%w/w. In addition, it can also be used, condensing after an extract in the range of w/w 0.5 to 50%, and raising concentration, and disintegration may be carried out. Furthermore, you may dilute and use. Especially definition does not have it, and if **** of the solvent used for an extract is nonpoisonous, it is good. For example, water or a solvent can use it suitably. An organic and inorganic thing can be used as a solvent, and it is suitably chosen by the mucopolysaccharide and/or the collagen content extract, the target mucopolysaccharide, and/or target collagen of this invention according to properties, such as solubility of a mucopolysaccharide and a collagen, for example, ethyl alcohol, an ethyl alcohol water solution, etc. can be used. Moreover, carbon dioxide gas etc. is mentioned as supercritical extraction. From the ease of handling, a water solution can use it suitably. Be [what is necessary / just although especially definition does not have water used for an extract and drink is presented], desalted water and distilled water are desirable.

[0033] Moreover, it can extract, adding a protease in an extract process and carrying out protease processing, as mentioned above. although especially definition does not have the amount of the protease used in this case – the source of an activity mucopolysaccharide, and/or 0.01 – 10%w/w per source dried food of a collagen — it is 0.05 – 5%w/w preferably.

[0034] Although especially definition does not have the extract approach, warm water dip coating, the warm water sprinkling method, and a hot-water-circulating method can be used suitably. extract temperature — 30degree-C **– 130 degrees C is 50–100 degrees C from extraction efficiency preferably. extract time amount — 5-minute **— it is 0.2 – 24 hours preferably for 32 hours. 3–8 are suitable for pH of the extract at this time. pH after an extract has [from / after flavor holding with preservation] desirable 4–7 order. Although not limited, the usual ** exception, especially solid liquid separation can be put in into the wire gauze of the shape of centrifugal separation or a basket, and can also be collected after an extract. cooling and filtering the macromolecule component which has solubilized the purification after solid liquid separation to the extract under low temperature (10 degrees C or less 0 degrees C or more) — or if the need is accepted, clear liquid can be obtained by using the persimmon juice and the slag lowering agent of a conventional method, condensing these components, settling them, and filtering them. Filtration is good to filter using the filter of 1micrometerphi or 0.45 micrometerphi preferably.

[0035] the mucopolysaccharide obtained by this invention and/or a collagen content extract (the extract of this invention may be called hereafter), a mucopolysaccharide, and/or a collagen — concentration after 120 degrees C and 20-second sterilization heating — it dilutes with/or water as it is, and sterile filtration is carried out further, and it can be filled up to a container and can consider as a product. Nitrogen gas charging may be performed at this time, after that, it can heat-sterilize for 1 minute and 90 degrees C can be used as a product.

[0036] although there is especially no definition as a configuration of the extract of this invention — the shape of a solid, such as a liquid and a dry matter, — being powdered .

[0037] Moreover, a mucopolysaccharide and/or a collagen are separable also by giving the separation approach of a well-known macromolecule component from the extract of this invention.

[0038] If it is the polysaccharide obtained from the viscous secrete of the animal origin as a mucopolysaccharide obtained by the manufacture approach of this invention, there is especially no definition, various glycosaminoglycans, a chitin, chitosan, etc. are illustrated, as glycosaminoglycan, hyaluronic acid, chondroitin sulfate, chondroitin, keratan sulfates I and II, heparin, a heparan sulfate, and dermatan sulfate will be illustrated, and chondroitin sulfate will be illustrated especially suitably. Moreover, as an obtained mucopolysaccharide, you may be the mixture of these mucopolysaccharides.

[0039] If needed, the food, drink, or seasoning containing the extract, mucopolysaccharide, and/or collagen of obtained this invention may add sweeteners, an acidulant, perfume, etc., may add a reducing agent and may add. Moreover, 1 – 10% v/v of ethyl alcohol is added to the drink concerned, and it is good for it also as the extract, mucopolysaccharide, and/or collagen content alcoholic beverage of this invention, for example. Furthermore, carbon dioxide gas is put in and the extract, mucopolysaccharide, and/or collagen content alcoholic beverage of this invention containing carbon dioxide gas are also made. Moreover, the extract, mucopolysaccharide, and/or collagen of this invention are used as concentration liquid or powder, and can be used for food or other food.

[0040] It is the food, drink, or seasoning which contains, adds, and/or dilutes and becomes about the extract, mucopolysaccharide, and/or collagen of this invention that what is necessary is just to contain the extract, mucopolysaccharide, and/or collagen of this invention as the food, drink, or seasoning of this invention.

Moreover, although there is especially no definition in the amount of the extract of this invention contained in the food, drink, or seasoning of this invention, a mucopolysaccharide, and/or a collagen, the food, drink, or seasoning which carries out w/w content of the extract, mucopolysaccharide, and/or collagen of this invention 90% from w/w 0.001% is illustrated.

[0041] In addition, the word of "content" said to the food, the drink, the seasoning, the below-mentioned feed, or the charge of makeup of this invention It is a thing containing the mind of content, addition, and dilution. With content Food, a drink, a seasoning, The mode that the active principle used by this invention into feed or the charge of makeup is contained The mode that addition dilutes with the raw material of food, a drink, a seasoning, feed, or the charge of makeup the active principle for which dilution is used by this invention in the mode of adding the active principle used for the raw material of food, a drink, a seasoning, feed, or the charge of makeup by this invention is said.

[0042] With the food of this invention, a drink, or a seasoning, that what is necessary is just to contain the extract, mucopolysaccharide, and/or collagen of this invention although there is especially no definition -- for example, a grain workpiece (a wheat flour workpiece and a starch workpiece --) A premix workpiece, noodles, macaronis, pans, bean jams, and sides fats-and-oils workpieces (plastic fat and tempura oil --), such as wheat gluten, rice vermicelli, strips of bean-jelly, and a packaged ricecake soybean workpieces (tofu --), such as salad oil, mayonnaise, and a dressing Meat products, such as bean paste and fermented soybeans (a hum, bacon, a pressed ham, sausage, etc.), a fishery product (frozen ground fish, boiled fish paste, a fishcake tube, a light, puffy cake made of ground fish, and deep-fried fish balls --) Dumplings, ****, fish ham, a sausage, a dried bonito, a roe workpiece, fishery canning, dairy products (raw material milk, a cream, yogurt, butter, and a cheese head --), such as food boiled down in soy vegetables and fruits workpieces (pastes --), such as condensed milk, milk powder, and ice cream confectionary (chocolate --), such as jams, pickles, a fruits drink, a vegetable drink, and a mix drink Biscuits, sweet rolls, a cake, rice-cake sweets, rice confectioneries, a candy, etc., an alcoholic beverage (sake, Chinese liquor, wine, whiskey, white distilled liquor, and vodka --) Brandy, gin, ram alcohol, Biel, a cool alcoholic beverage, fruit wine, taste drinks (green tea, tea, oolong tea, coffee, and a soft drink --), such as liqueur Seasonings, such as a fermented lactic-drink (soy sauce, the source, vinegar, mirin, dressing type seasoning, etc.), Canning, bottling, and packed food (****, rice with vegetables and meat, rice boiled with red beans, Calais, other various precooked food), half-desiccation or concentration food (liver paste, other spreads, and the juice of a side and Japanese noodles --) dried foods (extempore noodles, extempore Calais, and instant coffee --), such as concentration soup Powdered juice, powdered soup, extempore miso soup, precooked food, a precooked drink, Agricultural production and forest-products workpieces, such as frozen foods (sukiyaki, chawan-mushi, eel kabayaki, a hamburger, a steamed meat dumpling, a Chinese meat dumpling, various sticks, fruit cocktail, etc.), such as precooked soup, a solid food article and liquid food (soup etc.), and a spice, a zootechnics workpiece, a processed marine product, etc. are mentioned.

[0043] Although there is especially no definition, the method of manufacturing the food, drink, or seasoning of this invention can mention manufacture by the manufacturing method of cooking, processing and the food generally used, a drink, or a seasoning, and the extract, mucopolysaccharide, and/or collagen of this invention should just contain it in the manufactured food, drink, or seasoning.

[0044] In cooking and processing, before cooking / processing, the extract, mucopolysaccharide, and/or collagen of this invention may be further added after cooking / processing, cooking and a workpiece, and its ingredient may be added to the extract, mucopolysaccharide, and/or collagen of this invention, and the extract, mucopolysaccharide, and/or collagen of this invention may be diluted at the time of cooking and processing. It is the process of arbitration, the extract, mucopolysaccharide, and/or collagen of this invention may be added, the raw material may be added to the extract, mucopolysaccharide, and/or collagen of this invention in food, a drink or a seasoning, and a list, the extract, mucopolysaccharide, and/or collagen of this invention may be diluted, and food, a drink, or a seasoning may be made to contain in manufacture of food, a drink, or a seasoning. Moreover, addition may be performed over 1 time or several times. Therefore, the food, drink, or seasoning which contains the extract, mucopolysaccharide, and/or collagen of this invention of new food, a drink, or a seasoning, i.e., an effective dose, simple can be manufactured. Also when it passes through which process, the food, drink, or seasoning which contains, adds, and/or dilutes and becomes about the extract, mucopolysaccharide, and/or collagen of this invention is defined as the food, drink, and seasoning of this invention.

[0045] Moreover, the extract, mucopolysaccharide, and/or collagen of this invention can be corned by the well-known approach, and it can suppose that it is granular, and can also consider as the food of this invention.

[0046] Moreover, the feed for living things which contains, adds, and/or dilutes and becomes about the extract,

mucopolysaccharide, and/or collagen of this invention by this invention is offered. Moreover, the breeding approach of the living thing characterized by medicating a living thing with the extract, mucopolysaccharide, and/or collagen of this invention by this invention is offered. Moreover, the agent for living thing breeding characterized by containing the extract, mucopolysaccharide, and/or collagen of this invention by this invention is offered.

[0047] In these invention, living things are for example, a culture animal, a pet animal, etc., and livestock, a laboratory animal, domestic fowls, fishes, crustacean, or shellfish is illustrated as a culture animal. As feed, maintenance of condition and/or the feed for an improvement are illustrated. As an agent for living thing breeding, the agent for immersion, a feed additive, and a bevel-use additive are illustrated.

[0048] After prescribing 0.01–2000mg per day for the patient, and usually carrying out addition mixing into the raw material of artificial mixed feed the weight of 1kg of an object living thing or mixing with the powder raw material of artificial mixed feed, other raw materials can be made to carry out addition mixing of the extract, mucopolysaccharide, and/or collagen of this invention. Although what is necessary is for especially definition not to have a content in the feed for object living things of the extract of this invention, a mucopolysaccharide, and/or a collagen, and just to use it according to the object, 0.001 – 15 w/w% of rate is suitable.

[0049] As artificial mixed feed, the artificial mixed feed which uses vegetable fat and oil, such as animal fat and oil, such as vegetable raw materials, such as animal raw materials, such as a fish meal, casein, and a cuttlefish meal, soybean cake, wheat flour, starch, and yeast for feed, cod liver oil, and cuttlefish liver oil, soybean oil, and oleum rapae, vitamins, minerals, amino acid, an anti-oxidant, etc. as a raw material is mentioned. Moreover, the feed for fishes, such as fish meat minced meat, is mentioned.

[0050] There is especially no definition in the manufacture approach of the feed of this invention, and the effective dose of the extract of this invention, a mucopolysaccharide, and/or a collagen should just be contained, added and/or diluted in the manufactured feed.

[0051] Moreover, a medicine can also be prescribed for the patient by adding the extract, mucopolysaccharide, and/or collagen of this invention directly in a pool, a cistern, a maintenance tank or the water of a breeding field, seawater, etc., and immersing an object living thing. This dipping former is effective especially when the amount of feed intake of an object living thing falls. Although what is necessary is for especially definition not to have the concentration of the extract of this invention in water or seawater, a mucopolysaccharide, and/or a collagen, and just to use it according to the object, 0.00001 – 1 w/w% of rate is suitable.

[0052] Moreover, an object living thing may be made to take in by using the drink containing the extract, mucopolysaccharide, and/or collagen of this invention as the drink for breeding. Although what is necessary is for especially definition not to have the concentration of the extract of this invention in a drink, a mucopolysaccharide, and/or a collagen, and just to use it according to the object, 0.0001 – 1 w/w% of rate is suitable. What is necessary is just to produce in itself the agent for breeding which makes an active principle the extract, mucopolysaccharide, and/or collagen of this invention, for example, the agent for immersion, a feed additive, and a bevel-use additive by the well-known approach.

[0053] Although there is no definition as a living thing which can apply this invention, as a culture animal Livestock, such as a horse, a cow, a pig, a sheep, a goat, a camel, and Lamaism, a mouse, a rat, a guinea pig, Domestic fowls, such as laboratory animals, such as a rabbit, a hen, a duck, a Meleagris gallopavo, and *****, a red sea bream, Oplegnathus fasciatus, a flounder, a flounder, buri, a yellowtail, an amberjack, a tuna, a yellow jack, Fishes, such as a sweet fish, salmon masses, a tiger globefish, an eel, a loach, and a catfish, A dog, a cat, etc. are mentioned as shellfish [, such as an ear shell, a top shell, a scallop, and an oyster,], such as crustaceans, such as a prawn, black Tiger, a tie show shrimp, and a swimming crab, and a pet animal, and it can apply to land and an underwater animal widely.

[0054] By immersing an object living thing in the content liquid of making the feed containing the extract, mucopolysaccharide, and/or collagen of this invention take in or the extract of this invention, a mucopolysaccharide, and/or a collagen, condition, such as livestock, a laboratory animal, domestic fowls, fishes, crustacean, shellfish, and a pet animal, can be maintained good, or it can improve.

[0055] As the food, the drink, the seasoning, or feed of this invention, the extract, mucopolysaccharide, and/or collagen of this invention are contained, added and/or diluted, if the initial complement for discovering the physiological function contains, there is especially no definition in the configuration, and the configuration object which can take in the shape of the shape of a tablet, granularity, and a capsule etc. in taking orally is also included. In addition, the extract, mucopolysaccharide, and/or collagen of this invention are very useful as a manufacture raw material of food, a drink, a seasoning, or feed as a health food raw material. Furthermore, even

if it compares with the conventional mucopolysaccharide content extract, a mucopolysaccharide, and a collagen, an unpleasant smell from the raw material origin is reduced, and a color tone is also good and that of the extract, mucopolysaccharide, and/or collagen of this invention is very useful as a raw material of food, a drink, a seasoning, or feed also from these points.

[0056] As a remedy (the remedy of this invention may be called hereafter) which contains the extract, mucopolysaccharide, and/or collagen of this invention as an active principle Although there will be especially no definition if the extract, mucopolysaccharide, and/or collagen of this invention are contained as an active principle As the well-known physiological function which a mucopolysaccharide and a collagen have, for example, a physiological function which chondroitin sulfate has, carrying out smoothly of a joint organization, As a physiological function which fat blood serum *****, a blood coagulation inhibition operation, and a collagen have, the remedy using moisturization of the skin, activation of metabolism, and an immunity activation operation is mentioned.

[0057] The extract, mucopolysaccharide, and/or collagen which are used by this invention have various physiological functions, and can manufacture a remedy by making the extract, mucopolysaccharide, and/or collagen of this invention into an active principle.

[0058] The remedy of this invention makes an active principle the extract, mucopolysaccharide, and/or collagen of this invention, and should just form this into combination pharmaceutical preparation with the well-known support for remedies. generally manufacture of the pharmaceutical preparation concerned can permit the extract, mucopolysaccharide, and/or collagen of this invention pharmacologically — the support of the shape of liquefied or a solid-state — blending — and the need — responding — a solvent, a dispersant, an emulsifier, a buffer, a stabilizer, an excipient, a binder, disintegrator, lubricant, etc. — in addition, solid preparations, such as a tablet, a granule, powder, powders, and a capsule, — it can usually consider as liquids and solutions, such as liquids and solutions, suspension, and an emulsion. Moreover, it can consider as the desiccation article which can be made by addition of support suitable before using this as it is liquefied.

[0059] The support for remedies can be chosen according to the above-mentioned administration gestalt and a pharmaceutical form, and when it is an oral agent, starch, a lactose, white soft sugar, mannite, a carboxymethyl cellulose, corn starch, mineral salt, etc. are used. Moreover, in preparation of an oral agent, a binder, disintegrator, surfactant, abundant agent, and fluidity accelerator, corrigent, a coloring agent, perfume, etc. can also be blended further.

[0060] On the other hand, in the case of a parenteral agent, follow a conventional method, it makes the distilled water for injection as a diluent, a physiological saline, a grape-sugar water solution, the vegetable oil for injection, sesame oil, peanut oil, soybean oil, corn oil, propylene glycol, a polyethylene glycol, etc. dissolve thru/or suspend the extract, mucopolysaccharide, and/or collagen of this invention, and can be prepared by adding a germicide, a stabilizer, an isotonicizing agent, an aponia-ized agent, etc. if needed.

[0061] The remedy of this invention can be prescribed for the patient by the suitable route of administration according to formulation. There is also no medication method and especially definition can depend it on internal use, external use, and injection. Injections can be prescribed for the patient into intramuscular, hypodermically, and a hide etc. for example, in a vein, and a suppository etc. is included by external preparations.

[0062] Although the medicinal dose of this invention is suitably set up according to a patient's age applied to the formulation, a medication method, the purpose of use, and this, weight, and a symptom and is not fixed, the amounts of the extract of this invention generally contained in pharmaceutical preparation, a mucopolysaccharide, and/or a collagen are adult 1 sunny 0.1 – 2000 mg/kg. Of course, since a dose is changed according to various conditions, an amount smaller than the above-mentioned dose may be enough as it, or it may be required across the range. It administers orally as it is, and also it can add in the eating-and-drinking article of arbitration, and the remedy of this invention can also be made to take in daily. Moreover, the extract, mucopolysaccharide, and/or collagen of this invention may be used as a raw material of the eating-and-drinking article which it has as an active principle.

[0063] Next, the charge of makeup (the charge of makeup of this invention may be called hereafter) characterized by containing the extract, mucopolysaccharide, and/or collagen of this invention as an active principle is offered. By the charge of makeup of this invention, effectiveness, such as the well-known physiological function as a charge raw material of makeup which a mucopolysaccharide and a collagen have, for example, the improvement effectiveness of the moistness of the skin or resiliency, and the aging prevention effectiveness of the skin, can be acquired.

[0064] Preferably, and the content of the extract of this invention in the charge of makeup of this invention, a

mucopolysaccharide, and/or a collagen is usually depended 0.0001 to 20%, and is 0.001 - 5%w/w preferably.

[0065] The charge of makeup of this invention can be manufactured according to a conventional method according to well-known combination. As a charge of makeup of this invention, lotions, milky lotions, creams, packs, baths, a washing-their-face agent, bath soap, or a bath detergent is included, for example. Per activity, if it is desired amount, for example, lotions, when applying the charge of makeup of this invention, for example to the human whole face according to each application gestalt, a flare and gloss will be given to the skin and 0.01-5g of effectiveness of a request of this invention that a beautiful skin effect is acquired will be preferably, acquired, if about 0.1-2g is used more preferably.

[0066] Even if the mucopolysaccharide used for this invention and/or a collagen content extract, a mucopolysaccharide, and/or a collagen carry out oral single-dose administration of the kg in 1g /in internal use to a rat, the example of death is not accepted.

[0067]

[Example] Hereafter, although an example explains this invention still more concretely, this invention is not limited to these examples.

[0068] example 1 shark -- 500g of dry matters of a cartilage (area pellucida) -- a stream -- after dipping in inside, water was cut, 3g (BIOPURAZE SP-60, the Nagase Brothers Seikagaku make) of bacterial proteolytic enzyme of 1l. of well waters and marketing was added to this, and it digested at pH6.6 and 55 degrees C for 5 hours. 1l. of well waters which use sodium ascorbate for this invention article as a reducing agent at this time -- receiving -- 0.001, 0.01, and 0. -- 1 and 1.0 -- and w/v addition was carried out 5%. Contrast was taken as sodium ascorbate additive-free. to 2.2l. of each filtrate which carried out filter paper filtration and acquired this almost liquefied decomposition product after digestion, 10l. (95.5%v/v) of ethyl alcohol is added, it puts at 5 degrees C, and precipitation is deposited -- making -- a decantation and centrifugal separation (3000 revolutions per minute) -- carrying out -- settlings -- collecting -- a conventional method -- drying -- an air-dry matter -- obtaining -- a shark -- it considered as the cartilage extract. the obtained shark -- each cartilage extract (75.0**2.0g) was 54**1%w/w, such as moisture 10**1%w/w and a mucopolysaccharide, and amount of protein 36**1%w/w. It compares with 1%w/v solution of the contrast article which prepared the solution of these air-dry matters using 20-degree C distilled water, and was prepared from the 20-degree C same distilled water. The concentration of the solution of these air-dry matters that carry out a thing with stinking equivalent reinforcement the sodium ascorbate added when sensuously asked by five panel members -- 0.001, 0.01, and 0. -- by the case where they are 1, 1.0, and 5%w/v It corresponded to w/v, 1.5%w/v, 1.9%w/v, 2.1%w/v, and 1.8% w/v 1.4% from five persons' average, respectively. When stinking thing percentage reduction was expressed by x (concentration of concentration / this invention article of 1-contrast article)100(%), they were 28.5%, 33.3%, 47.4%, 52.3%, and 44.4%, respectively. Therefore, the smell is reduced clearly and this invention article which carries out enzyme processing under reduction conditions suited few inclinations of coloring. Moreover, since the concentration of the sodium ascorbate which is a reducing agent showed 20% or more of stinking thing reduction in the range of w/v 0.001 to 5.0% and showed 30% or more of stinking thing reduction in the range of w/v 0.01 to 5%, it was understood that the activity of the reducing agent of this range is suitable.

[0069] the 300ml scale performed the extractive reaction by the combination shown in a table 1 using the mucopolysaccharide (a shark -- origin food-grade chondroitin; -- 40% w/w of mucopolysaccharides, and 40% w/w of protein) of example 2 marketing.

[0070]

[A table 1]

表1

| | 本発明品 | | 対照 |
|----------------------|---------|---------|---------|
| | No. 1 | No. 2 | |
| 市販のムコ多糖 (%w / w) | 1 2 | 1 2 | 1 2 |
| アスコルビン酸Na (%w / v) | 0 . 3 | 0 . 3 | 0 |
| プロテアーゼ製剤* | | | |
| パパイン | 0 . 2 4 | 0 . 2 4 | 0 . 2 4 |
| (植物起源 % , w / v) | | | |
| ビオブラーゼSP-60 | 0 . 2 4 | 0 | 0 |
| (微生物起源 % , w / v) | | | |
| 蒸留水 | 残余 | 残余 | 残余 |

* : ナガセ生化学工業製

[0071] After 80 more degrees C performed the extractive reaction at 60 degrees C for 1 hour for 12 hours, it put the extractive reaction object into the cellulose tube, and dialyzed it at 5 degrees C to distilled water for 24 hours. Distilled water was exchanged 3 to 4 times during the dialysis period. According to the conventional method, it condensed and this dialysing fluid was freeze-dried so that it might become the capacity of the basis before dialysis, and each freeze-drying article was obtained. This invention article No.1 were collected for 27g (1.0% w/w of moisture, 15.0% w/w of protein), and a contrast article by 25g (1.0% w/w of moisture, 9.0% w/w of protein), this invention article No.2 were collected by 29g (1.0% w/w of moisture, 20% w/w of protein), and the reduction in a mucopolysaccharide was not accepted, but the mucopolysaccharide content ratio of this invention article improved.

[0072] Like the example 1, using 20-degree C distilled water, 1%w/v solution of a contrast article was prepared and the solution of the concentration with stinking it and equivalent reinforcement which carries out a thing was prepared in the freeze-drying article of this invention. It asked for assessment by five panel members, and it was performed by the average. Consequently, this invention article No.1 was equivalent to the smell of reinforcement with w/v and this invention article No.2 5.5%, stinking thing percentage reduction became 81.8% and 73.0%, respectively, and the smell of the source origin of a mucopolysaccharide decreased remarkably. [equivalent to the solution of a contrast article by 3.7%w/v concentration] Moreover, also in coloring of an extract, and this invention article approached white compared with the light yellow of a contrast article and was stinking as a food raw material, coloring is mitigated and quality improved. Thus, since this invention article adds neither the smell of an excess, nor coloring in the case of an activity, it can be expected that an activity application spreads further.

[0073] Collagen (cow origin, nonaqueous solubility) 200g of example 3 marketing was suspended in 1l. of v/v ethyl alcohol water solutions 10%, and in this invention article, it added so that it might become w/v 0.1% about ascorbic-acid Na as a reducing agent into a 10%v/v alcoholic water solution. Contrast was taken as reducing-agent additive-free. Respectively, it was air-dry after solid liquid separation at 55 degrees C with after 6-hour processing and a centrifuge (3000 revolutions per minute), and the processing object of 14% w/w of moisture was obtained. Like the example 1, using 20-degree C distilled water, 2%w/v solution of contrast was prepared and the solution of carrying-out-thing concentration with stinking it and equivalent reinforcement was prepared in this invention article. It asked for assessment by five panel members, and it was performed by the average. Consequently, this invention article was equivalent to the smell of reinforcement equivalent to contrast by w/v concentration 5.2%, stinking thing percentage reduction became 61.5%, and the smell of the collagen origin decreased remarkably. Moreover, this invention article approached white compared with the light yellow of contrast, coloring was mitigated and coloring of a processing object also carried out upgrading of it further, and it was stinking as a food raw material.

[0074] this invention article of example 4 example 1, and the shark of contrast — the mucopolysaccharide content drink of the recipe showing in a table 2 was prepared using the cartilage extract.

[0075]

[A table 2]

表2 ムコ多糖含有飲料

| | 本発明品 | 対照品 |
|--|------------|------------|
| | (%w / v) | (%w / v) |
| 還元剤処理サメ軟骨抽出物 (0 . 1 %w / v アスコルビン酸Na 処理) | 2 | 0 |
| 還元剤無処理サメ軟骨抽出物 | 0 | 2 |
| トレハロース | 2 . 5 | 2 . 5 |
| 1 / 5 リンゴ果汁 | 1 . 7 | 1 . 7 |
| 1 / 5 レモン果汁 | 0 . 13 | 0 . 13 |
| アスコルビン酸 | 0 . 04 | 0 . 04 |
| p H * | 4 . 0 | 4 . 0 |
| 酸度 0 . 1 N NaOH ml / 20 ml | 3 . 72 | 3 . 72 |
| ブリックス | 5 . 5 | 5 . 5 |

*p Hはクエン酸で調整

[0076] 200ml **** was filled up with each drink obtained by combination of a table 2, it was heat-sterilized for 15 minutes at 115 degrees C, and prepared the canned article. In organic-functions assessment, the panel member calculated the average by ten persons using five-step assessment (1 good - 5 wrong). The result is shown in a table 3.

[0077]

[A table 3]

表3 官能評価

| | 本発明品 | 対照品 |
|----|-------|-------|
| 味 | 2 . 7 | 3 . 2 |
| 香り | 2 . 5 | 3 . 2 |
| 色調 | 2 . 7 | 2 . 9 |
| 総合 | 2 . 6 | 3 . 1 |

[0078] a table 3 -- reducing-agent processing of this invention article -- a shark -- compared with the contrast article, there was no smell of the raw material origin, the drink using a cartilage extract had the good balance of sweet taste, an acid taste, and a taste, and there felt aftertaste refreshed in it and it turned into a drink of mucopolysaccharide content of a new flavor. a contrast article -- a shark -- the unpleasant smell of the cartilage origin was tight, flavor balance collapsed and aftertaste was also bad. Moreover, compared with the contrast article, the color tone of this invention article was also good.

[0079] the shark of example 5 example 1 -- the soup using a cartilage extract was prepared. the shark in which this invention article carried out reducing-agent processing -- the non-processed thing was used for a cartilage extract (ascorbic-acid Na, 0.1%w/v) and contrast. Combination of the soup containing a mucopolysaccharide is shown in a table 4. According to this combination, soup was prepared and 200ml can was filled up, and for 120 degrees C and 15 minutes, heat sterilization was performed and it considered as the canned article. In organic-functions assessment, the panel member calculated the average by ten persons using five-step assessment (1 good - 5 wrong). The result is shown in a table 5.

[0080]

[A table 4]

表4 ムコ多糖入り スープの配合

| | 本発明品 (%) | 対照品 (%) |
|---|-------------|-------------|
| 還元剤処理サメ軟骨抽出物 (0 . 1 %w / v アスコルビン酸Na 処理) | 4 | 0 |
| 還元剤無処理サメ軟骨抽出物 | 0 | 4 |
| 低強度寒天* | 0 . 2 5 | 0 . 2 5 |
| 乳清ミ ネラル | 0 . 6 0 | 0 . 6 0 |
| ポークエキス | 0 . 1 3 | 0 . 1 3 |
| 砂糖 | 0 . 1 0 | 0 . 1 0 |
| 胡椒 | 0 . 0 0 0 5 | 0 . 0 0 0 5 |
| アスコルビン酸 | 0 . 0 2 | 0 . 0 2 |
| p H | 5 . 0 | 5 . 0 |

*伊那食品工業社製

p Hはクエン酸又はクエン酸ナトリウムで調整

[0081]

[A table 5]

表5 官能評価

| スープ | 項目 | | | 総合 |
|------|-------|-------|-------|-------|
| | 味 | 香り | 色調 | |
| 本発明品 | 2 . 8 | 2 . 5 | 3 . 0 | 2 . 8 |
| 対照品 | 3 . 5 | 3 . 8 | 3 . 5 | 3 . 6 |

[0082] the taste which this invention article of aftertaste was good compared with contrast, and was felt refreshed from a table 5 -- being finished -- a shark -- the cartilage extract emphasized the flavor of a pork extract and prepared the whole flavor balance. contrast -- a shark -- the smell of the cartilage origin remained, a pork extract and harmony collapsed, and the inclination to lose the balance of the whole flavor was suited. thus -- from the field of cooking -- seeing -- the shark of this invention article -- the cartilage extract became clear [excelling as a seasoning] from the property of the flavor. Moreover, the color tone of this invention article was also good compared with the contrast article.

[0083] the shark which mixed 2.4kg of fish meals, 0.5kg of salt, and 0.3kg of monosodium glutamate as example 6 fish flour (a total of 3.2kg), and was obtained in the example 1 as this invention article and contrast -- 5g per 1kg of above-mentioned fish flour was added, respectively, and the freeze-drying article of a cartilage extract was corned according to the conventional method by additive-free. To 3.2kg of each granulation **** of these, it often mixed and 1.2kg of sesame was prepared. These fish flour was sprinkled over rice and organic-functions assessment was performed like the example 4. Consequently, it turned out that taste harmony of this invention article is carried out compared with contrast at the time of a fish meal or the flavor of Goma, and it has a function as secret seasoning. contrast -- a shark -- the unpleasant smell of the cartilage origin remained slightly, and the balance of a fish meal and the scent of Goma was lost, and bitterness remained in opening slightly. It turned out that this invention article is synthesized and the quality of fish flour is raised.

[0084] By combination of example 7 table 6, the hard candy was created according to the conventional method using the tableting machine by the pressure of 3000kg/cm² at the time of a making tablet. the reducing-agent processing obtained in the example 1 by this invention article -- a shark -- the shark of the contrast from which contrast was obtained in the example 1 using the cartilage extract -- the cartilage extract was used. consequently, the time of this invention article being included in opening -- a shark -- there was no unpleasant smell of the cartilage origin, the balance of the whole taste improved, and taste was smooth.

[0085]

[A table 6]

表6 配合表

| | 本発明品 | 対照品 |
|------------------------|------|-----|
| 還元剤処理サメ軟骨抽出物 (mg) | 100 | 0 |
| (0.1%w/v アスコルビン酸Na 処理) | | |
| 還元剤無処理サメ軟骨抽出物 (mg) | 0 | 100 |
| デキストリン (mg) | 100 | 100 |
| 還元麦芽糖水飴 (mg) | 715 | 715 |
| 乳糖 (mg) | 223 | 223 |
| カカオパウダー (mg) | 78 | 78 |
| 香料 (mg) | 19 | 19 |
| シロ糖脂肪酸エステル (mg) | 65 | 65 |

[0086]

[Effect of the Invention] By this invention, the manufacture approach of the new mucopolysaccharide and/or new collagen content extract with which the unpleasant smell of the colorless no-odor-izing or the colorless raw material origin was reduced, a mucopolysaccharide, and/or a collagen is offered by low cost. Moreover, the new mucopolysaccharide and/or collagen content extract with which the protein content was reduced are offered by performing protease processing to the manufacture approach concerned. Moreover, by this invention, the food containing the extract concerned, a mucopolysaccharide, and/or a collagen, a drink, a seasoning, feed, the charge of makeup, or a remedy is also offered.

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention] This invention is simple and relates to the mucopolysaccharide obtained by the manufacture approach of no odor nature and achromatism or the mucopolysaccharide and/or collagen content extract with which the unpleasant smell of the raw material origin was reduced, a mucopolysaccharide, and/or a collagen, and the manufacture approach concerned and/or a collagen content extract, a mucopolysaccharide and/or a collagen, the food containing these, a drink, a seasoning, feed, the charge of makeup, or a remedy. Moreover, this invention relates to the new mucopolysaccharide and/or collagen content extract of achromatism, and/or non-bromination of the new protein content was reduced and carried out.

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PRIOR ART

[Description of the Prior Art] A mucopolysaccharide means the polysaccharide obtained from the animal in a wide sense. As a raw material of a mucopolysaccharide, it is the cartilage of land animals, such as fishery animals, such as a shark, a whale, and a sea cucumber, a cow, a pig, a horse, and a hen, UROKO of a hide and a fish, etc., and has the characteristic unpleasant smell of the raw material origin with some purity of the obtained mucopolysaccharide.

[0003] The method of manufacturing a mucopolysaccharide content extract is divided roughly into the enzymatic process which makes an extract easy by carrying out decomposition clearance of the protein which adds the alkaline process extracted by lye from the raw material, the neutral salt method extracted with neutral salt liquid, and a protease, and lives together. In any case, pretreatment which removes impurity beforehand is required. Moreover, in an alkaline process, there is a fault into which a mucopolysaccharide is decomposed with alkali. By the neutral salt method, although decomposition of the mucopolysaccharide by the chemical is not produced, there is a fault more than which an extract takes long duration and the elution to a proteinic extract increases. In enzymatic process, in order to warm, there is a fault in which a lipid is eluted. In enzymatic process, since especially clearance of a lipid is complicated, in applying to mass production method, there is a difficulty practically. In view of this, after adding water, maintain a raw material at an elevated temperature, and the approach "JP,49-26234,A" and strong alkaline protease which extract a mucopolysaccharide are made to act, and the method "JP,50-8829,A" of performing deproteinization to an extract and coincidence is learned. However, the mucopolysaccharide content extract obtained using these approaches has an enough process about neither the smell of the raw material origin [**** / being complicated], nor coloring, a protein content, etc.

[0004] Glycosaminoglycan is a kind of a mucopolysaccharide, it consists of repeat disaccharides, and one of disaccharides always consists of D-glucosamine or D-galactosamine, and hyaluronic acid, chondroitin sulfate, chondroitin, keratan sulfates I and II, heparin, a heparin sulfuric acid, dermatan sulfate, etc. are known.

[0005] Chondroitin sulfate is a kind of the mucopolysaccharide obtained from the mucus nature secretion liquid of a fish or an animal, it exists in the condition (a mucopolysaccharide and protein complex) of having combined with protein in the body as a substrate component of connective tissue, such as a cartilage, a bone, a cornea, a lens, a blood vessel wall, and the skin, and chondroitin sulfate especially occupies 20 - 40%w/w of dry weight by the cartilage. Moreover, for chondroitin sulfate, N-acetyl-D-galactosamine, D-glucuronic acid, or L-iduronic acid is beta. - Make into a configuration unit the disaccharide which carried out the glycosidic linkage. The chondroitin 4-sulfuric acid which made the basic frame the polysaccharide of molecular weight 10,000-80,000, and the sulfuric-acid radical combined with the 4th place of C of N-acetyl-D-galactosamine (it is also called a chondroitin sulfate-A type), Or the chondroitin 6-sulfuric acid which the sulfuric-acid radical combined with the 6th place of C (it is also called a chondroitin sulfate-C type), The dermatan sulfate (it is also called a chondroitin sulfate-B type) which the sulfuric-acid radical combined with the 4th place of C of N-acetyl-D-galactosamine including L-iduronic acid instead of D-glucuronic acid is known widely. As for each of these, about one mol (6.4% w/w) of sulfur is contained per configuration unit.

[0006] Chondroitin sulfate makes metabolism lubrication for the water retention under organization of an animal and the body by the scale and this, is presumed to be what has achieved the activation function of a cell, and is widely used as a health food raw material. What is marketed as a food grade in the current commercial scene has many things containing 20% of chondroitin sulfate, and 40%, the component of unpleasant smell of a characteristic **** component or an animal, such as a processing smell and a heating smell, remains [a raw material] for fishes or the animal origin, and if little direction of fishes, and animal protein and a peptide may also be desirable and twists them in activity eye from taste, a product of high content of chondroitin sulfate is also

,desired.

[0007] The method of on the other hand reducing an unpleasant smell peculiar to a raw material by refining chondroitin sulfate to a high grade is also learned. For example, after carrying out protease processing and preparing by alcoholic fractionation after an alkali extract, the chondroitin sulfate of the high grade by which non-bromination was carried out can be obtained by refining with a chromatography. However, this approach is complicated and the manufacture approach of chondroitin sulfate that the unpleasant smell of no-odor-izing [that cost is also simple from this thing and low cost] or the raw material origin was reduced is desired.

[0008] A collagen is a main protein component which constitutes the connective tissue of an animal, and are configuration protein, such as epidermal tissues, such as a cartilaginous tissue, an organization of those other than a cartilage, and the skin. Molecular-weight about 100,000 polypeptide chain founds Rix to 3 counterclockwise twining, and these three chains of a collagen molecule settle further, and it takes the right hand wind double helical structure. Molecular weight is cylindrical structure with a die length [about 300,000 / of 300nm], and a diameter of 1.5nm, and the cylindrical molecule of these double helical structures becomes a bundle regularly in the direction of die length, and it builds fibril. This is assembling peculiar higher order structure for every organ further. Moreover, it is also known that a collagen will be hard to be decomposed by the usual protease. In dermis, about 75% of the dry weight of the whole skin is formed. As the physiological function, cells are tied, making the environment where a cell tends to work is known, and the cosmetics effectiveness, the improvement effect of aging change of the skin, etc. are known.

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EFFECT OF THE INVENTION

[Effect of the Invention] By this invention, the manufacture approach of the new mucopolysaccharide and/or new collagen content extract with which the unpleasant smell of the colorless no-odor-izing or the colorless raw material origin was reduced, a mucopolysaccharide, and/or a collagen is offered by low cost. Moreover, the new mucopolysaccharide and/or collagen content extract with which the protein content was reduced are offered by performing protease processing to the manufacture approach concerned. Moreover, by this invention, the food containing the extract concerned, a mucopolysaccharide, and/or a collagen, a drink, a seasoning, feed, the charge of makeup, or a remedy is also offered.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] In the raw material (source of a mucopolysaccharide) of a mucopolysaccharide, the component in the living body is contained variously, and, as for these, a characteristic stinking component and a taste component are eluted to a liquid part in a water alkali solution, neutral salt, and protease processing. Moreover, besides this, by an extract or heat-treatment at the time of sterilization, coloring increases or a heating smell generates at the reaction between components.

[0010] The physiological function of chondroitin sulfate Capacity accommodation and balance of water of extracellular fluid, Migration of the ion of extracellular fluid, accommodation, occification and the contribution to mineralization, carrying out smoothly of a joint organization, In order to know fat blood serum *****, a blood coagulation inhibition operation, cornea transparency maintenance, infection prevention, etc. and to fully demonstrate these physiological functions as food, a drink, feed, the charge of makeup, or a medicinal active principle, Development [that it is simple and low cost] of the manufacture approach of high grade chondroitin sulfate that the unpleasant smell of the raw material origin was reduced or non-bromination was carried out is desired.

[0011] The object of this invention is to offer the food containing the low cost mucopolysaccharide obtained by the manufacture approach of the new mucopolysaccharide and/or new collagen content extract of no odor nature, a mucopolysaccharide, and/or a collagen, and the manufacture approach concerned or an unpleasant smell was reduced and/or a collagen content extract, a mucopolysaccharide and/or a collagen, and these, a drink, a seasoning, feed, the charge of makeup, or a remedy. Moreover, the object of this invention is to offer the new mucopolysaccharide and/or collagen content extract of achromatism of no odor nature with which the protein content was reduced.

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MEANS

[Means for Solving the Problem] If this invention is outlined, invention of the 1st of this invention relates to the manufacture approach of the mucopolysaccharide characterized by including the process which extracts the source of a mucopolysaccharide, and/or the source of a collagen under existence of the reducibility matter, and/or a collagen content extract.

[0013] Invention of the 2nd of this invention relates to the manufacture approach of of the mucopolysaccharide and/or collagen which are characterized by including the process which extracts the source of a mucopolysaccharide, and/or the source of a collagen under existence of the reducibility matter.

[0014] In invention of the 1st and the 2nd of this invention, one or more reducibility matter chosen from the group which consists of an ascorbic acid, an ascorbic-acid salt, erythorbic acid, erythorbic acid, a cysteine, and a glutathione as reducibility matter is illustrated. Moreover, as the extraction condition, warm water or a solvent can extract and an extract can be carried out in 30-130 degrees C for 5 minutes to 32 hours. Moreover, the source of a mucopolysaccharide and/or the source of a collagen where protease processing of the source of a mucopolysaccharide and/or the source of a collagen was carried out can also be used, and a protease can also be added in an extract process. Moreover, in invention of the 1st and the 2nd of this invention, as a mucopolysaccharide, one sort or two sorts or more of glycosaminoglycans are illustrated, and chondroitin sulfate is suitably illustrated as glycosaminoglycan.

[0015] Invention of the 3rd and the 4th of this invention relates to the mucopolysaccharide manufactured by invention of the 1st or the 2nd of this invention, respectively and/or a collagen content extract or a mucopolysaccharide, and/or a collagen.

[0016] Invention of the 5th of this invention relates to the food containing the mucopolysaccharide and/or collagen of invention of the 6th of the mucopolysaccharide of invention of the 3rd of this invention, a collagen content extract, and/or this invention, a drink, a seasoning, or feed.

[0017] Invention of the 6th of this invention relates to the charge of makeup which contains the mucopolysaccharide and/or collagen of invention of the 6th of the mucopolysaccharide of invention of the 3rd of this invention, a collagen content extract, and/or this invention as an active principle.

[0018] Invention of the 7th of this invention relates to the remedy which contains the mucopolysaccharide and/or collagen of invention of the 6th of the mucopolysaccharide of invention of the 3rd of this invention, a collagen content extract, and/or this invention as an active principle.

[0019] Invention of the 9th of this invention relates to the mucopolysaccharide and/or collagen by which the unpleasant smell of no-odor-izing obtained by invention of the 2nd of this invention or the source of a mucopolysaccharide, and/or the source origin of a collagen was reduced, concerning the mucopolysaccharide and/or collagen content extract with which the unpleasant smell of no-odor-izing or the source of a mucopolysaccharide where invention of the 8th of this invention is obtained by invention of the 1st of this invention, and/or the source origin of a collagen was reduced.

[0020] Invention of the 11th of this invention relates to the no odor nature mucopolysaccharide and/or collagen which are obtained by invention of the 2nd of this invention, concerning the no odor nature mucopolysaccharide and/or collagen content extract with which invention of the 10th of this invention is obtained by invention of the 1st of this invention.

[0021] Invention of the 11th of this invention relates to the new achromatism mucopolysaccharide and/or collagen content extract which are obtained by invention of the 1st of this invention.

[0022] In the manufacture approach of invention of the 1st of this invention, invention of the 12th of this invention relates to the new mucopolysaccharide and/or new collagen content extract which are obtained by the

manufacture approach of the mucopolysaccharide and/or collagen content extract with which the protease was added in the extract process and with which protein was reduced, moreover protease processing of the source of a mucopolysaccharide and/or the source of a collagen was carried out.

[0023]

[Embodiment of the Invention] Although the source of a mucopolysaccharide used by this invention will not have especially definition if it can be used as a raw material of a mucopolysaccharide, cartilages, hides, etc. of a land animal, such as fishery animals, such as a whale, a shark, and a sea cucumber, a cow, a pig, a horse, a sheep, and a hen, are illustrated. Moreover, UROKO of fishes can also be used. Furthermore, the mucopolysaccharide of the mucopolysaccharide inclusion and marketing by which extract processing was carried out once can also be used as a source of a mucopolysaccharide of this invention.

[0024] Although there will be especially no definition if it can be used as a raw material of a collagen as a source of a collagen in this invention, the hide of mammalian, a bone, a cartilage, a bone of birds, etc. can be used, for example. Moreover, in this invention, the collagen inclusion extracted once and a commercial collagen are also contained in the source of a collagen of this invention.

[0025] the raw material which is a raw material of a mucopolysaccharide and is used also as a raw material of a collagen, for example, a shark, — when a cartilage is used as a raw material and it extracts by the extract approach of this invention, or when it mixes, the source of a mucopolysaccharide, for example, a commercial mucopolysaccharide, and the source of a collagen, for example, a commercial collagen, it considers as a raw material and it extracts by the extract approach of this invention, the extract containing both a mucopolysaccharide and a collagen can be obtained. Naturally these are also included by the mucopolysaccharide and collagen content extract of this invention.

[0026] Although there is nothing, especially definition may perform mere rinsing, the torrefaction, roast, and steaming according to the usual approach, and may perform protease processing like the after-mentioned, and can also perform pretreatment before an extract combining these. although there is especially no definition as a configuration of the source of a mucopolysaccharide after pretreatment — the shape of powder and a flake, a split, a flake, and a cube cut — or what is necessary is to come out as it is and just to use it

[0027] Although there is especially no definition, the reducibility matter used for this invention has that desirable with which edible is presented, and it is suitable for it to use one or more chosen from the group of an ascorbic acid, an ascorbic-acid salt, erythorbic acid, erythorbic acid, a cysteine, and a glutathione from the effect affect the effectiveness and the taste of reduction. Here, an ascorbic-acid salt and erythorbic acid should just be salts, such as sodium, a potassium, and calcium. the liquid which uses the amount of the reducibility matter to be used for an extract — receiving — 0.005 – 5.0%w/w — it is 0.01 – 2.0%w/w preferably.

[0028] Moreover, when using a protease in the extract from the source of a mucopolysaccharide, and/or the source of a collagen The source of a mucopolysaccharide and/or the source of a collagen which carried out protease processing beforehand as pretreatment as mentioned above under reducibility matter existence Hot water or the approach of carrying out solvent extraction, Which approach of hot water, the approach of carrying out solvent extraction, or the approach that combined these is also employable, carrying out protease processing of the source of a mucopolysaccharide, and/or the source of a collagen under reducibility matter existence. Or by the approach concerned The new mucopolysaccharide and/or new collagen content extract which were reduced or removed, a proteinic mucopolysaccharide, and/or a proteinic collagen can be obtained.

[0029] The source of a mucopolysaccharide and/or the unpleasant smell of the source origin of a collagen, and the stinking component and coloring component of the extract down-stream-processing origin are reduced or removed, protein is also reduced or removed further, and the mucopolysaccharide of this invention and/or collagen content extract from which protein was reduced or removed, a mucopolysaccharide, and/or a collagen do not break down the flavor of other mixture as a raw material raw material, and are useful also especially as food, a drink, a seasoning, feed, the charge of makeup, or a medicinal raw material. Moreover, since the protein content which can serve as allergen is reduced, the mucopolysaccharide and/or collagen content extract with which such a protein content was reduced, the mucopolysaccharide, and/or the collagen are useful also especially as the food which made the allergic response avoid, a drink, a seasoning, feed, the charge of makeup, or a medicinal raw material.

[0030] There is especially no definition, as for the protease used for protease processing, the thing of an animal, vegetation, and the microorganism origin can be used, for example, as a thing of the animal origin, a chymotrypsin, a trypsin, a pepsin, or chymosin is mentioned, as a thing of the vegetable origin, a papain or bromelain is mentioned and the acidity of bacteria, an Actinomyces, an aspergillus, mold, or a basidiomycete,

neutrality, and alkaline protease are mentioned as a thing of the microorganism origin. Moreover, it is included by the protease here, and they can be used for these proteases by collagenase, esterase, and keratinases, choosing according to the class of the extract to manufacture, a mucopolysaccharide, and/or collagen. Moreover, at least one or more and the protease of carboxypeptidase, aminopeptidase, lipase, glucoamylase, alpha-amylase, a pectinase, a cellulase, and hemicellulase may be used together.

[0031] the source of a mucopolysaccharide used although especially definition does not have the amount of the protease used by considering the source of a mucopolysaccharide, and/or the source of a collagen as pretreatment when carrying out protease processing, and/or 0.01 – 10%w/w per source dried food of a collagen — it is 0.05 – 5%w/w preferably. Although there will be especially no definition if, as for a solvent, an enzyme can act, according to properties, such as solubility of a mucopolysaccharide and a collagen, it is suitably chosen by the mucopolysaccharide and/or the collagen content extract, the target mucopolysaccharide, and/or target collagen of this invention, for example, water or an ethyl alcohol water solution (ethyl alcohol concentration, 0 – 50%v/v) can use it suitably by them. Moreover, although especially definition does not have operative temperature by the activity enzyme and it is 30–120 degrees C, its 50–100 degrees C are desirable on an activity. Although reaction time can be suitably set up with reaction temperature, it is 0.2 – 24 hours preferably for 0.1 to 32 hours.

[0032] The weight of the source of a mucopolysaccharide to the sum total weight of the liquid which uses the extraction condition of this invention for an extract, the source of a mucopolysaccharide, and/or the source of a collagen, and/or the source of a collagen is 1 – 20%w/w from the point of a flavor under 0.5 – 50%w/w. In addition, it can also be used, condensing after an extract in the range of w/w 0.5 to 50%, and raising concentration, and disintegration may be carried out. Furthermore, you may dilute and use. Especially definition does not have it, and if **** of the solvent used for an extract is nonpoisonous, it is good. For example, water or a solvent can use it suitably. An organic and inorganic thing can be used as a solvent, and it is suitably chosen by the mucopolysaccharide and/or the collagen content extract, the target mucopolysaccharide, and/or target collagen of this invention according to properties, such as solubility of a mucopolysaccharide and a collagen, for example, ethyl alcohol, an ethyl alcohol water solution, etc. can be used. Moreover, carbon dioxide gas etc. is mentioned as supercritical extraction. From the ease of handling, a water solution can use it suitably. Be [what is necessary / just although especially definition does not have water used for an extract and drink is presented], desalted water and distilled water are desirable.

[0033] Moreover, it can extract, adding a protease in an extract process and carrying out protease processing, as mentioned above. although especially definition does not have the amount of the protease used in this case — the source of an activity mucopolysaccharide, and/or 0.01 – 10%w/w per source dried food of a collagen — it is 0.05 – 5%w/w preferably.

[0034] Although especially definition does not have the extract approach, warm water dip coating, the warm water sprinkling method, and a hot-water-circulating method can be used suitably. extract temperature — 30degree-C **– 130 degrees C is 50–100 degrees C from extraction efficiency preferably. extract time amount — 5-minute **– it is 0.2 – 24 hours preferably for 32 hours. 3–8 are suitable for pH of the extract at this time. pH after an extract has [from / after flavor holding with preservation] desirable 4–7 order. Although not limited, the usual ** exception, especially solid liquid separation can be put in into the wire gauze of the shape of centrifugal separation or a basket, and can also be collected after an extract. cooling and filtering the macromolecule component which has solubilized the purification after solid liquid separation to the extract under low temperature (10 degrees C or less 0 degrees C or more) — or if the need is accepted, clear liquid can be obtained by using the persimmon juice and the slag lowering agent of a conventional method, condensing these components, settling them, and filtering them. Filtration is good to filter using the filter of 1micrometerphi or 0.45 micrometerphi preferably.

[0035] the mucopolysaccharide obtained by this invention and/or a collagen content extract (the extract of this invention may be called hereafter), a mucopolysaccharide, and/or a collagen — concentration after 120 degrees C and 20-second sterilization heating — it dilutes with/or water as it is, and sterile filtration is carried out further, and it can be filled up to a container and can consider as a product. Nitrogen gas charging may be performed at this time, after that, it can heat-sterilize for 1 minute and 90 degrees C can be used as a product.

[0036] although there is especially no definition as a configuration of the extract of this invention — the shape of a solid, such as a liquid and a dry matter, — being powdered .

[0037] Moreover, a mucopolysaccharide and/or a collagen are separable also by giving the separation approach of a well-known macromolecule component from the extract of this invention.

[0038] If it is the polysaccharide obtained from the viscous secrete of the animal origin as a mucopolysaccharide obtained by the manufacture approach of this invention, there is especially no definition, various glycosaminoglycans, a chitin, chitosan, etc. are illustrated, as glycosaminoglycan, hyaluronic acid, chondroitin sulfate, chondroitin, keratan sulfates I and II, heparin, a heparan sulfate, and dermatan sulfate will be illustrated, and chondroitin sulfate will be illustrated especially suitably. Moreover, as an obtained mucopolysaccharide, you may be the mixture of these mucopolysaccharides.

[0039] If needed, the food, drink, or seasoning containing the extract, mucopolysaccharide, and/or collagen of obtained this invention may add sweeteners, an acidulant, perfume, etc., may add a reducing agent and may add. Moreover, 1 - 10% v/v of ethyl alcohol is added to the drink concerned, and it is good for it also as the extract, mucopolysaccharide, and/or collagen content alcoholic beverage of this invention, for example. Furthermore, carbon dioxide gas is put in and the extract, mucopolysaccharide, and/or collagen content alcoholic beverage of this invention containing carbon dioxide gas are also made. Moreover, the extract, mucopolysaccharide, and/or collagen of this invention are used as concentration liquid or powder, and can be used for food or other food.

[0040] It is the food, drink, or seasoning which contains, adds, and/or dilutes and becomes about the extract, mucopolysaccharide, and/or collagen of this invention that what is necessary is just to contain the extract, mucopolysaccharide, and/or collagen of this invention as the food, drink, or seasoning of this invention. Moreover, although there is especially no definition in the amount of the extract of this invention contained in the food, drink, or seasoning of this invention, a mucopolysaccharide, and/or a collagen, the food, drink, or seasoning which carries out w/w content of the extract, mucopolysaccharide, and/or collagen of this invention 90% from w/w 0.001% is illustrated.

[0041] In addition, the word of "content" said to the food, the drink, the seasoning, the below-mentioned feed, or the charge of makeup of this invention It is a thing containing the mind of content, addition, and dilution. With content Food, a drink, a seasoning, The mode that the active principle used by this invention into feed or the charge of makeup is contained The mode that addition dilutes with the raw material of food, a drink, a seasoning, feed, or the charge of makeup the active principle for which dilution is used by this invention in the mode of adding the active principle used for the raw material of food, a drink, a seasoning, feed, or the charge of makeup by this invention is said.

[0042] With the food of this invention, a drink, or a seasoning, that what is necessary is just to contain the extract, mucopolysaccharide, and/or collagen of this invention although there is especially no definition -- for example, a grain workpiece (a wheat flour workpiece and a starch workpiece --) A premix workpiece, noodles, macaronis, pans, bean jams, and sides fats-and-oils workpieces (plastic fat and tempura oil --), such as wheat gluten, rice vermicelli, strips of bean-jelly, and a packaged ricecake soybean workpieces (tofu --), such as salad oil, mayonnaise, and a dressing Meat products, such as bean paste and fermented soybeans (a hum, bacon, a pressed ham, sausage, etc.), a fishery product (frozen ground fish, boiled fish paste, a fishcake tube, a light, puffy cake made of ground fish, and deep-fried fish balls --) Dumplings, ****, fish ham, a sausage, a dried bonito, a roe workpiece, fishery canning, dairy products (raw material milk, a cream, yogurt, butter, and a cheese head --), such as food boiled down in soy vegetables and fruits workpieces (pastes --), such as condensed milk, milk powder, and ice cream confectionary (chocolate --), such as jams, pickles, a fruits drink, a vegetable drink, and a mix drink Biscuits, sweet rolls, a cake, rice-cake sweets, rice confectioneries, a candy, etc., an alcoholic beverage (sake, Chinese liquor, wine, whiskey, white distilled liquor, and vodka --) Brandy, gin, ram alcohol, Biel, a cool alcoholic beverage, fruit wine, taste drinks (green tea, tea, oolong tea, coffee, and a soft drink --), such as liqueur Seasonings, such as a fermented lactic-drink (soy sauce, the source, vinegar, mirin, dressing type seasoning, etc.), Canning, bottling, and packed food (****, rice with vegetables and meat, rice boiled with red beans, Calais, other various precooked food), half-desiccation or concentration food (liver paste, other spreads, and the juice of a side and Japanese noodles --) dried foods (extempore noodles, extempore Calais, and instant coffee --), such as concentration soup Powdered juice, powdered soup, extempore miso soup, precooked food, a precooked drink, Agricultural production and forest-products workpieces, such as frozen foods (sukiyaki, chawan-mushi, eel kabayaki, a hamburger, a steamed meat dumpling, a Chinese meat dumpling, various sticks, fruit cocktail, etc.), such as precooked soup, a solid food article and liquid food (soup etc.), and a spice, a zootechnics workpiece, a processed marine product, etc. are mentioned.

[0043] Although there is especially no definition, the method of manufacturing the food, drink, or seasoning of this invention can mention manufacture by the manufacturing method of cooking, processing and the food generally used, a drink, or a seasoning, and the extract, mucopolysaccharide, and/or collagen of this invention should just contain it in the manufactured food, drink, or seasoning.

[0044] In cooking and processing, before cooking / processing, the extract, mucopolysaccharide, and/or collagen of this invention may be further added after cooking / processing, cooking and a workpiece, and its ingredient may be added to the extract, mucopolysaccharide, and/or collagen of this invention, and the extract, mucopolysaccharide, and/or collagen of this invention may be diluted at the time of cooking and processing. It is the process of arbitration, the extract, mucopolysaccharide, and/or collagen of this invention may be added, the raw material may be added to the extract, mucopolysaccharide, and/or collagen of this invention in food, a drink or a seasoning, and a list, the extract, mucopolysaccharide, and/or collagen of this invention may be diluted, and food, a drink, or a seasoning may be made to contain in manufacture of food, a drink, or a seasoning. Moreover, addition may be performed over 1 time or several times. Therefore, the food, drink, or seasoning which contains the extract, mucopolysaccharide, and/or collagen of this invention of new food, a drink, or a seasoning, i.e., an effective dose, simple can be manufactured. Also when it passes through which process, the food, drink, or seasoning which contains, adds, and/or dilutes and becomes about the extract, mucopolysaccharide, and/or collagen of this invention is defined as the food, drink, and seasoning of this invention.

[0045] Moreover, the extract, mucopolysaccharide, and/or collagen of this invention can be corned by the well-known approach, and it can suppose that it is granular, and can also consider as the food of this invention.

[0046] Moreover, the feed for living things which contains, adds, and/or dilutes and becomes about the extract, mucopolysaccharide, and/or collagen of this invention by this invention is offered. Moreover, the breeding approach of the living thing characterized by medicating a living thing with the extract, mucopolysaccharide, and/or collagen of this invention by this invention is offered. Moreover, the agent for living thing breeding characterized by containing the extract, mucopolysaccharide, and/or collagen of this invention by this invention is offered.

[0047] In these invention, living things are for example, a culture animal, a pet animal, etc., and livestock, a laboratory animal, domestic fowls, fishes, crustacean, or shellfish is illustrated as a culture animal. As feed, maintenance of condition and/or the feed for an improvement are illustrated. As an agent for living thing breeding, the agent for immersion, a feed additive, and a bevel-use additive are illustrated.

[0048] After prescribing 0.01-2000mg per day for the patient, and usually carrying out addition mixing into the raw material of artificial mixed feed the weight of 1kg of an object living thing or mixing with the powder raw material of artificial mixed feed, other raw materials can be made to carry out addition mixing of the extract, mucopolysaccharide, and/or collagen of this invention. Although what is necessary is for especially definition not to have a content in the feed for object living things of the extract of this invention, a mucopolysaccharide, and/or a collagen, and just to use it according to the object, 0.001 - 15 w/w% of rate is suitable.

[0049] As artificial mixed feed, the artificial mixed feed which uses vegetable fat and oil, such as animal fat and oil, such as vegetable raw materials, such as animal raw materials, such as a fish meal, casein, and a cuttlefish meal, soybean cake, wheat flour, starch, and yeast for feed, cod liver oil, and cuttlefish liver oil, soybean oil, and oleum rapae, vitamins, minerals, amino acid, an anti-oxidant, etc. as a raw material is mentioned. Moreover, the feed for fishes, such as fish meat minced meat, is mentioned.

[0050] There is especially no definition in the manufacture approach of the feed of this invention, and the effective dose of the extract of this invention, a mucopolysaccharide, and/or a collagen should just be contained, added and/or diluted in the manufactured feed.

[0051] Moreover, a medicine can also be prescribed for the patient by adding the extract, mucopolysaccharide, and/or collagen of this invention directly in a pool, a cistern, a maintenance tank or the water of a breeding field, seawater, etc., and immersing an object living thing. This dipping former is effective especially when the amount of feed intake of an object living thing falls. Although what is necessary is for especially definition not to have the concentration of the extract of this invention in water or seawater, a mucopolysaccharide, and/or a collagen, and just to use it according to the object, 0.00001 - 1 w/w% of rate is suitable.

[0052] Moreover, an object living thing may be made to take in by using the drink containing the extract, mucopolysaccharide, and/or collagen of this invention as the drink for breeding. Although what is necessary is for especially definition not to have the concentration of the extract of this invention in a drink, a mucopolysaccharide, and/or a collagen, and just to use it according to the object, 0.0001 - 1 w/w% of rate is suitable. What is necessary is just to produce in itself the agent for breeding which makes an active principle the extract, mucopolysaccharide, and/or collagen of this invention, for example, the agent for immersion, a feed additive, and a bevel-use additive by the well-known approach.

[0053] Although there is no definition as a living thing which can apply this invention, as a culture animal Livestock, such as a horse, a cow, a pig, a sheep, a goat, a camel, and Lamaism, a mouse, a rat, a guinea pig,

Domestic fowls, such as laboratory animals, such as a rabbit, a hen, a duck, a *Meleagris gallopavo*, and ****, a red sea bream, *Oplegnathus fasciatus*, a flounder, a flounder, buri, a yellowtail, an amberjack, a tuna, a yellow jack, Fishes, such as a sweet fish, salmon masses, a tiger globefish, an eel, a loach, and a catfish, A dog, a cat, etc. are mentioned as shellfish [such as an ear shell, a top shell, a scallop, and an oyster,], such as crustaceans, such as a prawn, black Tiger, a tie show shrimp, and a swimming crab, and a pet animal, and it can apply to land and an underwater animal widely.

[0054] By immersing an object living thing in the content liquid of making the feed containing the extract, mucopolysaccharide, and/or collagen of this invention take in or the extract of this invention, a mucopolysaccharide, and/or a collagen, condition, such as livestock, a laboratory animal, domestic fowls, fishes, crustacean, shellfish, and a pet animal, can be maintained good, or it can improve.

[0055] As the food, the drink, the seasoning, or feed of this invention, the extract, mucopolysaccharide, and/or collagen of this invention are contained; added and/or diluted, if the initial complement for discovering the physiological function contains, there is especially no definition in the configuration, and the configuration object which can take in the shape of the shape of a tablet, granularity, and a capsule etc. in taking orally is also included. In addition, the extract, mucopolysaccharide, and/or collagen of this invention are very useful as a manufacture raw material of food, a drink, a seasoning, or feed as a health food raw material. Furthermore, even if it compares with the conventional mucopolysaccharide content extract, a mucopolysaccharide, and a collagen, an unpleasant smell from the raw material origin is reduced, and a color tone is also good and that of the extract, mucopolysaccharide, and/or collagen of this invention is very useful as a raw material of food, a drink, a seasoning, or feed also from these points.

[0056] As a remedy (the remedy of this invention may be called hereafter) which contains the extract, mucopolysaccharide, and/or collagen of this invention as an active principle Although there will be especially no definition if the extract, mucopolysaccharide, and/or collagen of this invention are contained as an active principle As the well-known physiological function which a mucopolysaccharide and a collagen have, for example, a physiological function which chondroitin sulfate has, carrying out smoothly of a joint organization, As a physiological function which fat blood serum *****, a blood coagulation inhibition operation, and a collagen have, the remedy using moisturization of the skin, activation of metabolism, and an immunity activation operation is mentioned.

[0057] The extract, mucopolysaccharide, and/or collagen which are used by this invention have various physiological functions, and can manufacture a remedy by making the extract, mucopolysaccharide, and/or collagen of this invention into an active principle.

[0058] The remedy of this invention makes an active principle the extract, mucopolysaccharide, and/or collagen of this invention, and should just form this into combination pharmaceutical preparation with the well-known support for remedies. generally manufacture of the pharmaceutical preparation concerned can permit the extract, mucopolysaccharide, and/or collagen of this invention pharmacologically — the support of the shape of liquefied or a solid-state — blending — and the need — responding — a solvent, a dispersant, an emulsifier, a buffer, a stabilizer, an excipient, a binder, disintegrator, lubricant, etc. — in addition, solid preparations, such as a tablet, a granule, powder, powders, and a capsule, — it can usually consider as liquids and solutions, such as liquids and solutions, suspension, and an emulsion. Moreover, it can consider as the desiccation article which can be made by addition of support suitable before using this as it is liquefied.

[0059] The support for remedies can be chosen according to the above-mentioned administration gestalt and a pharmaceutical form, and when it is an oral agent, starch, a lactose, white soft sugar, mannite, a carboxymethyl cellulose, corn starch, mineral salt, etc. are used. Moreover, in preparation of an oral agent, a binder, disintegrator, surfactant, abundant agent, and fluidity accelerator, corrigent, a coloring agent, perfume, etc. can also be blended further.

[0060] On the other hand, in the case of a parenteral agent, follow a conventional method, it makes the distilled water for injection as a diluent, a physiological saline, a grape-sugar water solution, the vegetable oil for injection, sesame oil, peanut oil, soybean oil, corn oil, propylene glycol, a polyethylene glycol, etc. dissolve thru/or suspend the extract, mucopolysaccharide, and/or collagen of this invention, and can be prepared by adding a germicide, a stabilizer, an isotonicizing agent, an aponia-ized agent, etc. if needed.

[0061] The remedy of this invention can be prescribed for the patient by the suitable route of administration according to formulation. There is also no medication method and especially definition can depend it on internal use, external use, and injection. Injections can be prescribed for the patient into intramuscular, hypodermically, and a hide etc. for example, in a vein, and a suppository etc. is included by external preparations.

[0062] Although the medicinal dose of this invention is suitably set up according to a patient's age applied to the formulation, a medication method, the purpose of use, and this, weight, and a symptom and is not fixed, the amounts of the extract of this invention generally contained in pharmaceutical preparation, a mucopolysaccharide, and/or a collagen are adult 1 sunny 0.1 – 2000 mg/kg. Of course, since a dose is changed according to various conditions, an amount smaller than the above-mentioned dose may be enough as it, or it may be required across the range. It administers orally as it is, and also it can add in the eating-and-drinking article of arbitration, and the remedy of this invention can also be made to take in daily. Moreover, the extract, mucopolysaccharide, and/or collagen of this invention may be used as a raw material of the eating-and-drinking article which it has as an active principle.

[0063] Next, the charge of makeup (the charge of makeup of this invention may be called hereafter) characterized by containing the extract, mucopolysaccharide, and/or collagen of this invention as an active principle is offered. By the charge of makeup of this invention, effectiveness, such as the well-known physiological function as a charge raw material of makeup which a mucopolysaccharide and a collagen have, for example, the improvement effectiveness of the moistness of the skin or resiliency, and the aging prevention effectiveness of the skin, can be acquired.

[0064] Preferably, and the content of the extract of this invention in the charge of makeup of this invention, a mucopolysaccharide, and/or a collagen is usually depended 0.0001 to 20%, and is 0.001 – 5%w/w preferably.

[0065] The charge of makeup of this invention can be manufactured according to a conventional method according to well-known combination. As a charge of makeup of this invention, lotions, milky lotions, creams, packs, baths, a washing-their-face agent, bath soap, or a bath detergent is included, for example. Per activity, if it is desired amount, for example, lotions, when applying the charge of makeup of this invention, for example to the human whole face according to each application gestalt, a flare and gloss will be given to the skin and 0.01–5g of effectiveness of a request of this invention that a beautiful skin effect is acquired will be preferably, acquired, if about 0.1–2g is used more preferably.

[0066] Even if the mucopolysaccharide used for this invention and/or a collagen content extract, a mucopolysaccharide, and/or a collagen carry out oral single-dose administration of the kg in 1g /in internal use to a rat, the example of death is not accepted.

[Translation done.]

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- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
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- 3.In the drawings, any words are not translated.

EXAMPLE

[Example] Hereafter, although an example explains this invention still more concretely, this invention is not limited to these examples.

[0068] example 1 shark -- 500g of dry matters of a cartilage (area pellucida) -- a stream -- after dipping in inside, water was cut, 3g (BIOPURAZE SP-60, the Nagase Brothers Seikagaku make) of bacterial proteolytic enzyme of 1l. of well waters and marketing was added to this, and it digested at pH6.6 and 55 degrees C for 5 hours. 1l. of well waters which use sodium ascorbate for this invention article as a reducing agent at this time -- receiving -- 0.001, 0.01, and 0. -- 1 and 1.0 -- and w/v addition was carried out 5%. Contrast was taken as sodium ascorbate additive-free. to 2.2l. of each filtrate which carried out filter paper filtration and acquired this almost liquefied decomposition product after digestion, 10l. (95.5%v/v) of ethyl alcohol is added, it puts at 5 degrees C, and precipitation is deposited -- making -- a decantation and centrifugal separation (3000 revolutions per minute) -- carrying out -- settlings -- collecting -- a conventional method -- drying -- an air-dry matter -- obtaining -- a shark -- it considered as the cartilage extract. the obtained shark -- each cartilage extract (75.0**2.0g) was 54**1%w/w, such as moisture 10**1%w/w and a mucopolysaccharide, and amount of protein 36**1%w/w. It compares with 1%w/v solution of the contrast article which prepared the solution of these air-dry matters using 20-degree C distilled water, and was prepared from the 20-degree C same distilled water. The concentration of the solution of these air-dry matters that carry out a thing with stinking equivalent reinforcement the sodium ascorbate added when sensuously asked by five panel members -- 0.001, 0.01, and 0. -- by the case where they are 1, 1.0, and 5%w/v It corresponded to w/v, 1.5%w/v, 1.9%w/v, 2.1%w/v, and 1.8% w/v 1.4% from five persons' average, respectively. When stinking thing percentage reduction was expressed by x (concentration of concentration / this invention article of 1-contrast article)100(%), they were 28.5%, 33.3%, 47.4%, 52.3%, and 44.4%, respectively. Therefore, the smell is reduced clearly and this invention article which carries out enzyme processing under reduction conditions suited few inclinations of coloring. Moreover, since the concentration of the sodium ascorbate which is a reducing agent showed 20% or more of stinking thing reduction in the range of w/v 0.001 to 5.0% and showed 30% or more of stinking thing reduction in the range of w/v 0.01 to 5%, it was understood that the activity of the reducing agent of this range is suitable.

[0069] the 300ml scale performed the extractive reaction by the combination shown in a table 1 using the mucopolysaccharide (a shark -- origin food-grade chondroitin; -- 40% w/w of mucopolysaccharides, and 40% w/w of protein) of example 2 marketing.

[0070]

[A table 1]

表1

| | 本発明品 | | 対照 |
|----------------------|---------|---------|---------|
| | No. 1 | No. 2 | |
| 市販のムコ多糖 (%w / w) | 1 2 | 1 2 | 1 2 |
| アスコルビン酸Na (%w / v) | 0 . 3 | 0 . 3 | 0 |
| プロテアーゼ製剤* | | | |
| パパイン | 0 . 2 4 | 0 . 2 4 | 0 . 2 4 |
| (植物起源 % , w / v) | | | |
| ビオブラーゼSP-60 | 0 . 2 4 | 0 | 0 |
| (微生物起源 % , w / v) | | | |
| 蒸留水 | 残余 | 残余 | 残余 |

*: ナガセ生化学工業製

[0071] After 80 more degrees C performed the extractive reaction at 60 degrees C for 1 hour for 12 hours, it put the extractive reaction object into the cellulose tube, and dialyzed it at 5 degrees C to distilled water for 24 hours. Distilled water was exchanged 3 to 4 times during the dialysis period. According to the conventional method, it condensed and this dialysing fluid was freeze-dried so that it might become the capacity of the basis before dialysis, and each freeze-drying article was obtained. This invention article No.1 were collected for 27g (1.0% w/w of moisture, 15.0% w/w of protein), and a contrast article by 25g (1.0% w/w of moisture, 9.0% w/w of protein), this invention article No.2 were collected by 29g (1.0% w/w of moisture, 20% w/w of protein), and the reduction in a mucopolysaccharide was not accepted, but the mucopolysaccharide content ratio of this invention article improved.

[0072] Like the example 1, using 20-degree C distilled water, 1%w/v solution of a contrast article was prepared and the solution of the concentration with stinking it and equivalent reinforcement which carries out a thing was prepared in the freeze-drying article of this invention. It asked for assessment by five panel members, and it was performed by the average. Consequently, this invention article No.1 was equivalent to the smell of reinforcement with w/v and this invention article No.2 5.5%, stinking thing percentage reduction became 81.8% and 73.0%, respectively, and the smell of the source origin of a mucopolysaccharide decreased remarkably. [equivalent to the solution of a contrast article by 3.7%w/v concentration] Moreover, also in coloring of an extract, and this invention article approached white compared with the light yellow of a contrast article and was stinking as a food raw material, coloring is mitigated and quality improved. Thus, since this invention article adds neither the smell of an excess, nor coloring in the case of an activity, it can be expected that an activity application spreads further.

[0073] Collagen (cow origin, nonaqueous solubility) 200g of example 3 marketing was suspended in 1l. of v/v ethyl alcohol water solutions 10%, and in this invention article, it added so that it might become w/v 0.1% about ascorbic-acid Na as a reducing agent into a 10%v/v alcoholic water solution. Contrast was taken as reducing-agent additive-free. Respectively, it was air-dry after solid liquid separation at 55 degrees C with after 6-hour processing and a centrifuge (3000 revolutions per minute), and the processing object of 14% w/w of moisture was obtained. Like the example 1, using 20-degree C distilled water, 2%w/v solution of contrast was prepared and the solution of carrying-out-thing concentration with stinking it and equivalent reinforcement was prepared in this invention article. It asked for assessment by five panel members, and it was performed by the average. Consequently, this invention article was equivalent to the smell of reinforcement equivalent to contrast by w/v concentration 5.2%, stinking thing percentage reduction became 61.5%, and the smell of the collagen origin decreased remarkably. Moreover, this invention article approached white compared with the light yellow of contrast, coloring was mitigated and coloring of a processing object also carried out upgrading of it further, and it was stinking as a food raw material.

[0074] this invention article of example 4 example 1, and the shark of contrast — the mucopolysaccharide content drink of the recipe showing in a table 2 was prepared using the cartilage extract.

[0075]

[A table 2]

表2 ムコ多糖含有飲料

| | 本発明品 | 対照品 |
|--|------------|------------|
| | (%w / v) | (%w / v) |
| 還元剤処理サメ軟骨抽出物 (0 . 1 %w / v アスコルビン酸Na 処理) | 2 | 0 |
| 還元剤無処理サメ軟骨抽出物 | 0 | 2 |
| トレハロース | 2 . 5 | 2 . 5 |
| 1 / 5 リンゴ果汁 | 1 . 7 | 1 . 7 |
| 1 / 5 レモン果汁 | 0 . 13 | 0 . 13 |
| アスコルビン酸 | 0 . 04 | 0 . 04 |
| p H * | 4 . 0 | 4 . 0 |
| 酸度 0 . 1 N Na OH ml / 20 ml | 3 . 72 | 3 . 72 |
| ブリックス | 5 . 5 | 5 . 5 |

*p Hはクエン酸で調整

[0076] 200ml **** was filled up with each drink obtained by combination of a table 2, it was heat-sterilized for 15 minutes at 115 degrees C, and prepared the canned article. In organic-functions assessment, the panel member calculated the average by ten persons using five-step assessment (1 good - 5 wrong). The result is shown in a table 3.

[0077]

[A table 3]

表3 官能評価

| | 本発明品 | 対照品 |
|----|-------|-------|
| 味 | 2 . 7 | 3 . 2 |
| 香り | 2 . 5 | 3 . 2 |
| 色調 | 2 . 7 | 2 . 9 |
| 総合 | 2 . 6 | 3 . 1 |

[0078] a table 3 -- reducing-agent processing of this invention article -- a shark -- compared with the contrast article, there was no smell of the raw material origin, the drink using a cartilage extract had the good balance of sweet taste, an acid taste, and a taste, and there felt aftertaste refreshed in it and it turned into a drink of mucopolysaccharide content of a new flavor. a contrast article -- a shark -- the unpleasant smell of the cartilage origin was tight, flavor balance collapsed and aftertaste was also bad. Moreover, compared with the contrast article, the color tone of this invention article was also good.

[0079] the shark of example 5 example 1 -- the soup using a cartilage extract was prepared. the shark in which this invention article carried out reducing-agent processing -- the non-processed thing was used for a cartilage extract (ascorbic-acid Na, 0.1%w/v) and contrast. Combination of the soup containing a mucopolysaccharide is shown in a table 4. According to this combination, soup was prepared and 200ml can was filled up, and for 120 degrees C and 15 minutes, heat sterilization was performed and it considered as the canned article. In organic-functions assessment, the panel member calculated the average by ten persons using five-step assessment (1 good - 5 wrong). The result is shown in a table 5.

[0080]

[A table 4]

表4 ムコ多糖入り スープの配合

| | 本発明品 (%) | 対照品 (%) |
|--|----------|---------|
| 還元剤処理サメ軟骨抽出物 (0.1%w/v アスコルビン酸Na 処理) | 4 | 0 |
| 還元剤無処理サメ軟骨抽出物 | 0 | 4 |
| 低強度寒天* | 0.25 | 0.25 |
| 乳清ミネラル | 0.60 | 0.60 |
| ポークエキス | 0.13 | 0.13 |
| 砂糖 | 0.10 | 0.10 |
| 胡椒 | 0.0005 | 0.0005 |
| アスコルビン酸 | 0.02 | 0.02 |
| pH | 5.0 | 5.0 |

*伊那食品工業社製

pHはクエン酸又はクエン酸ナトリウムで調整

[0081]

[A table 5]

表5 官能評価

| スープ | 項目 | | | 総合 |
|------|-----|-----|-----|-----|
| | 味 | 香り | 色調 | |
| 本発明品 | 2.8 | 2.5 | 3.0 | 2.8 |
| 対照品 | 3.5 | 3.8 | 3.5 | 3.6 |

[0082] the taste which this invention article of aftertaste was good compared with contrast, and was felt refreshed from a table 5 -- being finished -- a shark -- the cartilage extract emphasized the flavor of a pork extract and prepared the whole flavor balance. contrast -- a shark -- the smell of the cartilage origin remained, a pork extract and harmony collapsed, and the inclination to lose the balance of the whole flavor was suited. thus -- from the field of cooking -- seeing -- the shark of this invention article -- the cartilage extract became clear [excelling as a seasoning] from the property of the flavor. Moreover, the color tone of this invention article was also good compared with the contrast article.

[0083] the shark which mixed 2.4kg of fish meals, 0.5kg of salt, and 0.3kg of monosodium glutamate as example 6 fish flour (a total of 3.2kg), and was obtained in the example 1 as this invention article and contrast -- 5g per 1kg of above-mentioned fish flour was added, respectively, and the freeze-drying article of a cartilage extract was corned according to the conventional method by additive-free. To 3.2kg of each granulation **** of these, it often mixed and 1.2kg of sesame was prepared. These fish flour was sprinkled over rice and organic-functions assessment was performed like the example 4. Consequently, it turned out that taste harmony of this invention article is carried out compared with contrast at the time of a fish meal or the flavor of Goma, and it has a function as secret seasoning. contrast -- a shark -- the unpleasant smell of the cartilage origin remained slightly, and the balance of a fish meal and the scent of Goma was lost, and bitterness remained in opening slightly. It turned out that this invention article is synthesized and the quality of fish flour is raised.

[0084] By combination of example 7 table 6, the hard candy was created according to the conventional method using the tableting machine by the pressure of 3000kg/cm² at the time of a making tablet. the reducing-agent processing obtained in the example 1 by this invention article -- a shark -- the shark of the contrast from which contrast was obtained in the example 1 using the cartilage extract -- the cartilage extract was used. consequently, the time of this invention article being included in opening -- a shark -- there was no unpleasant smell of the cartilage origin, the balance of the whole taste improved, and taste was smooth.

[0085]

[A table 6]

表6 配合表

| | 本発明品 | 対照品 |
|---|-------|-------|
| 還元剤処理サメ軟骨抽出物 (mg) (0 . 1 %w / v アスコルビン酸Na 処理) | 1 0 0 | 0 |
| 還元剤無処理サメ軟骨抽出物 (mg) | 0 | 1 0 0 |
| デキストリン (mg) | 1 0 0 | 1 0 0 |
| 還元麦芽糖水飴 (mg) | 7 1 5 | 7 1 5 |
| 乳糖 (mg) | 2 2 3 | 2 2 3 |
| カカオパウダー (mg) | 7 8 | 7 8 |
| 香料 (mg) | 1 9 | 1 9 |
| シヨ 糖脂肪酸エステル (mg) | 6 5 | 6 5 |

[Translation done.]

(19) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11) 特許出願公開番号

特開2003-73403

(P2003-73403A)

(43) 公開日 平成15年3月12日 (2003.3.12)

| (51) Int.Cl. ⁷ | 識別記号 | F I | テ-マ-ト [*] (参考) |
|--------------------------------------|-------|---------------|-------------------------|
| C 0 8 B 37/08 | | C 0 8 B 37/08 | A 2 B 1 5 0 |
| | | | Z 4 B 0 1 7 |
| A 2 3 K 1/16 | 3 0 3 | A 2 3 K 1/16 | 3 0 3 D 4 B 0 1 8 |
| | | | 3 0 3 F 4 B 0 4 7 |
| | 3 0 4 | | 3 0 4 A 4 C 0 7 6 |
| 審査請求 未請求 請求項の数25 O L (全 12 頁) 最終頁に続く | | | |

(21) 出願番号 特願2001-264474 (P2001-264474)

(22) 出願日 平成13年8月31日 (2001.8.31)

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(54) 【発明の名称】 ムコ多糖及び／又はコラーゲン

(57) 【要約】

【課題】 低コストで不快臭の低減された又は無臭化されたムコ多糖及び／又はコラーゲン含有抽出物、ムコ多糖及び／又はコラーゲンの製造方法、当該製造方法により得られるムコ多糖含有抽出物、コラーゲン含有抽出物、ムコ多糖及び／又はコラーゲンおよびこれらを含む食品、飲料、調味料、飼料、化粧料又は医薬を提供すること。

【解決手段】 ムコ多糖源及び／又はコラーゲン源を還元性物質の存在下で抽出する工程を包含することを特徴とするムコ多糖及び／又はコラーゲン含有抽出物、ムコ多糖及び／又はコラーゲンの製造方法、当該製造方法により得られるムコ多糖及び／又はコラーゲン含有抽出物、ムコ多糖及び／又はコラーゲンおよびこれらを含む食品、飲料、調味料、飼料、化粧料又は医薬を提供する。また、当該製造方法とプロテアーゼ処理を併用し、タンパク質含量が低減された新規なムコ多糖及び／又はコラーゲン含有抽出物を提供する。

【特許請求の範囲】

【請求項1】 ムコ多糖源及び／又はコラーゲン源を還元性物質の存在下で抽出する工程を包含することを特徴とするムコ多糖及び／又はコラーゲン含有抽出物の製造方法。

【請求項2】 還元性物質がアスコルビン酸、アスコルビン酸塩、エリスルビン酸、エリスルビン酸塩、システイン及びグルタチオンからなる群より選択される1つ以上の還元性物質である請求項1に記載のムコ多糖及び／又はコラーゲン含有抽出物の製造方法。

【請求項3】 還元性物質の存在下で温水または溶剤により抽出する工程を包含することを特徴とする請求項1又は2に記載のムコ多糖及び／又はコラーゲン含有抽出物の製造方法。

【請求項4】 抽出が30～130℃において5分～32時間実施されることを特徴とする請求項1～3いずれか1項に記載のムコ多糖及び／又はコラーゲン含有抽出物の製造方法。

【請求項5】 ムコ多糖源及び／又はコラーゲン源がプロテアーゼ処理されたムコ多糖源及び／又はコラーゲン源である、及び／又は抽出工程においてプロテアーゼを添加することを特徴とする請求項1～4いずれか1項に記載のムコ多糖及び／又はコラーゲン含有抽出物の製造方法。

【請求項6】 ムコ多糖含有抽出物が1種又は2種以上のグリコサミノグリカンを含むことを特徴とする請求項1～5いずれか1項に記載のムコ多糖含有抽出物の製造方法。

【請求項7】 グリコサミノグリカンがコンドロイチン硫酸である請求項6記載のムコ多糖含有抽出物の製造方法。

【請求項8】 請求項1～7いずれか1項に記載のムコ多糖及び／又はコラーゲン含有抽出物の製造方法により得られるムコ多糖及び／又はコラーゲン含有抽出物。

【請求項9】 ムコ多糖源及び／又はコラーゲン源を還元性物質の存在下で抽出する工程を包含することを特徴とするムコ多糖及び／又はコラーゲンの製造方法。

【請求項10】 還元性物質がアスコルビン酸、アスコルビン酸塩、エリスルビン酸、エリスルビン酸塩、システイン及びグルタチオンからなる群より選択される1つ以上の還元性物質である請求項9に記載のムコ多糖及び／又はコラーゲンの製造方法。

【請求項11】 還元性物質の存在下で温水または溶剤により抽出する工程を包含することを特徴とする請求項9又は10に記載のムコ多糖及び／又はコラーゲンの製造方法。

【請求項12】 抽出が30～130℃において5分～32時間実施されることを特徴とする請求項9～11いずれか1項に記載のムコ多糖及び／又はコラーゲンの製造方法。

【請求項13】 ムコ多糖源及び／又はコラーゲン源がプロテアーゼ処理されたムコ多糖源及び／又はコラーゲン源である、及び／又は抽出工程においてプロテアーゼを添加することを特徴とする請求項9～12いずれか1項に記載のムコ多糖及び／又はコラーゲンの製造方法。

【請求項14】 ムコ多糖がグリコサミノグリカンである請求項9～13いずれか1項に記載のムコ多糖の製造方法。

【請求項15】 グリコサミノグリカンがコンドロイチン硫酸である請求項14記載のムコ多糖の製造方法。

【請求項16】 請求項9～15いずれか1項に記載のムコ多糖及び／又はコラーゲンの製造方法により得られるムコ多糖及び／又はコラーゲン。

【請求項17】 請求項8記載のムコ多糖及び／又はコラーゲン含有抽出物、及び／又は請求項16記載のムコ多糖及び／又はコラーゲンを含有することを特徴とする食品、飲料、調味料又は飼料。

【請求項18】 請求項8記載のムコ多糖及び／又はコラーゲン含有抽出物、及び／又は請求項16記載のムコ多糖及び／又はコラーゲンを有効成分として含有することを特徴とする化粧料。

【請求項19】 請求項8記載のムコ多糖及び／又はコラーゲン含有抽出物、及び／又は請求項16記載のムコ多糖及び／又はコラーゲンを有効成分として含有することを特徴とする医薬。

【請求項20】 請求項1～7いずれか1項に記載のムコ多糖及び／又はコラーゲン含有抽出物の製造方法により得られるムコ多糖及び／又はコラーゲン含有抽出物であって、無臭化又はムコ多糖源及び／又はコラーゲン源由来の不快臭の低減されたムコ多糖及び／又はコラーゲン含有抽出物。

【請求項21】 請求項9～15いずれか1項に記載のムコ多糖及び／又はコラーゲンの製造方法により得られるムコ多糖及び／又はコラーゲンであって、無臭化又はムコ多糖源及び／又はコラーゲン源由来の不快臭の低減されたムコ多糖及び／又はコラーゲン。

【請求項22】 請求項1～7いずれか1項に記載のムコ多糖及び／又はコラーゲン含有抽出物の製造方法により得られる無臭性ムコ多糖及び／又はコラーゲン含有抽出物。

【請求項23】 請求項9～15いずれか1項に記載のムコ多糖及び／又はコラーゲンの製造方法により得られる無臭性ムコ多糖及び／又はコラーゲン。

【請求項24】 請求項1～7いずれか1項に記載のムコ多糖及び／又はコラーゲン含有抽出物の製造方法により得られる無色性ムコ多糖及び／又はコラーゲン含有抽出物。

【請求項25】 請求項5記載のムコ多糖及び／又はコラーゲン含有抽出物の製造方法により得られる低タンパクムコ多糖及び／又はコラーゲン含有抽出物。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、簡便で、無臭性および無色性の、又は原料由来の不快臭が低減されたムコ多糖及び／又はコラーゲン含有抽出物、ムコ多糖及び／又はコラーゲンの製造方法、当該製造方法により得られるムコ多糖及び／又はコラーゲン含有抽出物、ムコ多糖及び／又はコラーゲン、これらを含有する食品、飲料、調味料、飼料、化粧料又は医薬に関する。また本発明は、新規なタンパク質含量が低減された、無臭化された及び／又は無色性の新規なムコ多糖及び／又はコラーゲン含有抽出物に関する。

【0002】

【従来の技術】ムコ多糖とは、広義には動物から得られた多糖を意味する。ムコ多糖の原料としては、鮫、鯨、ナマコ等の水産動物、牛、豚、馬、鶏等の陸上動物の軟骨や皮、魚のウロコ等で、得られたムコ多糖の純度によっては原料由来の特有の不快臭を有している。

【0003】ムコ多糖含有抽出物を製造する方法は、その原料よりアルカリ液で抽出するアルカリ法、中性塩液で抽出する中性塩法、プロテアーゼを加えて、共存するタンパク質を分解除去することにより抽出を容易にする酵素法等に大別される。何れの場合も、夾雑物を予め除去する前処理が必要である。また、アルカリ法では、アルカリによりムコ多糖が分解される欠点がある。中性塩法では、薬品によるムコ多糖の分解は生じないが、抽出に長時間を要し、かつ、タンパク質の抽出液への溶出が多くなる欠点がある。酵素法では、加温するため脂質が溶出してくる欠点がある。特に酵素法では脂質の除去は煩雑であるので大量生産に適用する場合には実用上難点がある。これに鑑み、原料を水を加えた後高温に保ち、ムコ多糖の抽出を行う方法「特開昭49-26234号」、強アルカリプロテアーゼを作用せしめて、抽出と同時に除タンパク質を行う方法「特開昭50-8829号」が知られている。しかし、これらの方法を用いて得られたムコ多糖含有抽出物は、工程が複雑であったり、原料由来の臭いや着色、タンパク質含量等について十分なものではない。

【0004】グリコサミノグリカンハムコ多糖の一種であり、繰り返し二糖で構成され、二糖の内の1つは常にD-グルコサミンかD-ガラクトサミンのいずれかからなり、ヒアルロン酸、コンドロイチン硫酸、コンドロイチン、ケラタン硫酸IおよびII、ヘパリン、ヘパリン硫酸及びデルマタン硫酸等が知られている。

【0005】コンドロイチン硫酸は、魚や動物の粘質性分泌液から得られたムコ多糖の一種で、人体では軟骨、骨、角膜、水晶体、血管壁、皮膚などの結合組織の基質成分としてタンパク質と結合した状態（ムコ多糖・タンパク質複合体）で存在し、特に軟骨では、コンドロイチン硫酸が乾燥重量の20～40%w/wを占める。ま

た、コンドロイチン硫酸は、N-アセチル-D-ガラクトサミンとD-グルクロン酸またはL-イズロン酸がβ-グリコシド結合した二糖を構成単位とする、分子量10,000～80,000の多糖類を基本骨格とし、N-アセチル-D-ガラクトサミンのC4位に硫酸基が結合したコンドロイチン4-硫酸（コンドロイチン硫酸-Aタイプともいう）、またはC6位に硫酸基が結合したコンドロイチン6-硫酸（コンドロイチン硫酸-Cタイプともいう）、D-グルクロン酸の代わりにL-イズロン酸を含みN-アセチル-D-ガラクトサミンのC4位に硫酸基が結合したデルマタン硫酸（コンドロイチン硫酸-Bタイプともいう）が広く知られている。これらは、何れも構成単位当たり硫酸がほぼ1モル（6.4%w/w）含まれている。

【0006】コンドロイチン硫酸は、動物、人体の組織中の保水をはかり、これによって新陳代謝を潤滑にし、細胞の賦活機能を果たしているものと推定されており、健康食品素材として広く使用されている。現在市場で食品用として市販されているものは、コンドロイチン硫酸20%または40%を含有するものが多く、原料が魚類や動物由来のため、特有の魚臭成分や動物の加工臭や加熱臭等の不快臭の成分が残り、また、魚類および動物タンパク質・ペプチドも呈味の上から少ない方が好ましい場合もあり、使用目的によってはコンドロイチン硫酸の高含有の製品も望まれている。

【0007】一方、コンドロイチン硫酸を高純度に精製することにより原料特有の不快臭を低減させる方法も知られている。例えば、アルカリ抽出後、プロテアーゼ処理し、アルコール分画により調製した後、クロマトグラフィーにより精製することで無臭化された高純度のコンドロイチン硫酸を得ることができる。しかし、この方法は複雑でコストもかかることから、簡便で低コストな無臭化又は原料由来の不快臭の低減されたコンドロイチン硫酸の製造方法が望まれている。

【0008】コラーゲンは動物の結合組織を構成する主要タンパク質成分であり、軟骨組織や軟骨以外の組織、皮膚などの表皮組織等の構成タンパク質である。コラーゲン分子は、分子量約10万のポリペプチド鎖が3本左巻きヘリックスをつくり、さらにこの3本の鎖がまとまって右巻の2重らせん構造をとる。分子量は約30万、長さ300nm、直径1.5nmの棒状構造で、これらの2重らせん構造の棒状分子が、長さの方向に規則正しく束になり、フィブリルをつくる。これがさらに各器官毎に独特の高次構造を組み立てている。またコラーゲンは通常のプロテアーゼで分解されにくいことも知られている。真皮においては皮膚全体の乾燥重量の約75%を占めている。その生理機能としては、細胞同士をつなぎ止め、細胞が活動しやすい環境を作り出すことが知られており、美容効果、皮膚の加齢変化の改善効果などが知られている。

【0009】

【発明が解決しようとする課題】ムコ多糖の原料（ムコ多糖源）中には、種々体内成分が含まれており、これらは水アルカリ溶液、中性塩およびプロテアーゼ処理で特有な臭い成分や呈味成分が液部へ溶出される。また、これ以外にも抽出や殺菌時の加熱処理により、着色が増加したり、成分間の反応で加熱臭が生成する。

【0010】コンドロイチン硫酸の生理作用は、細胞外液の容量調節と水分代謝、細胞外液のイオンの移動と調節、化骨および石灰化への寄与、関節組織の円滑化、脂

10 血清澄作用と血液凝固阻止作用、角膜透明度維持、感染防止等が知られており、食品、飲料、飼料、化粧品または医薬の有効成分としてこれらの生理機能を十分に発揮するため、簡便で低コストな無臭化されたまたは原料由来の不快臭の低減された高純度コンドロイチン硫酸の製造方法の開発が望まれている。

【0011】

【課題を解決するための手段】本発明を概説すれば、本発明の第1の発明は、ムコ多糖源及び／又はコラーゲン源を還元性物質の存在下で抽出する工程を包含すること

30 を特徴とするムコ多糖及び／又はコラーゲン含有抽出物の製造方法に関する。

【0013】本発明の第2の発明は、ムコ多糖源及び／又はコラーゲン源を還元性物質の存在下で抽出する工程を包含することを特徴とするムコ多糖及び／又はコラーゲンの製造方法に関する。

【0014】本発明の第1及び第2の発明において、還元性物質としては、アスコルビン酸、アスコルビン酸塩、エリソルビン酸、エリソルビン酸塩、システイン及びグルタチオンからなる群より選択される1つ以上の還元性物質が例示される。またその抽出条件としては、温水または溶剤により抽出することができ、抽出は30～130℃において5分～32時間実施されることができ

【0015】本発明の第3、第4の発明は、それぞれ本発明の第1または第2の発明で製造されるムコ多糖及び／又はコラーゲン含有抽出物、又はムコ多糖及び／又はコラーゲンに関する。

【0016】本発明の第5の発明は、本発明の第3の発明のムコ多糖及び／又はコラーゲン含有抽出物、及び／又は本発明の第6の発明のムコ多糖及び／又はコラーゲンを含有する食品、飲料、調味料又は飼料に関する。

【0017】本発明の第6の発明は、本発明の第3の発明のムコ多糖及び／又はコラーゲン含有抽出物、及び／又は本発明の第6の発明のムコ多糖及び／又はコラーゲンを有効成分として含有する化粧品に関する。

【0018】本発明の第7の発明は、本発明の第3の発明のムコ多糖及び／又はコラーゲン含有抽出物、及び／又は本発明の第6の発明のムコ多糖及び／又はコラーゲンを有効成分として含有する医薬に関する。

【0019】本発明の第8の発明は、本発明の第1の発明により得られる無臭化又はムコ多糖源及び／又はコラーゲン源由来の不快臭の低減されたムコ多糖及び／又はコラーゲン含有抽出物に関し、また、本発明の第9の発明は、本発明の第2の発明により得られる無臭化又はムコ多糖源及び／又はコラーゲン源由来の不快臭の低減されたムコ多糖及び／又はコラーゲンに関する。

【0020】本発明の第10の発明は本発明の第1の発明により得られる無臭性ムコ多糖及び／又はコラーゲン含有抽出物に関し、また、本発明の第11の発明は、本発明の第2の発明により得られる無臭性ムコ多糖及び／又はコラーゲンに関する。

【0021】本発明の第11の発明は、本発明の第1の発明により得られる、新規な無色性ムコ多糖及び／又はコラーゲン含有抽出物に関する。

【0022】本発明の第12の発明は、本発明の第1の発明の製造方法において、ムコ多糖源及び／又はコラーゲン源がプロテアーゼ処理された、また抽出工程においてプロテアーゼが添加されたムコ多糖及び／又はコラーゲン含有抽出物の製造方法により得られる、新規な、タンパク質の低減されたムコ多糖及び／又はコラーゲン含有抽出物に関する。

【0023】

40 【発明の実施の形態】本発明で用いるムコ多糖源とは、ムコ多糖の原料として使用できるものであれば特に限定はないが、鯨、鮫、ナマコ等の水産動物、牛、豚、馬、羊、鶏等の陸上動物の軟骨や皮等が例示される。また、魚類のウロコも用いることができる。さらに、一度抽出処理されたムコ多糖含有物や市販のムコ多糖も本発明のムコ多糖源として用いることができる。

【0024】本発明においてコラーゲン源としては、コラーゲンの原料として使用できるものであれば特に限定はないが、例えば哺乳動物の皮、骨、鳥類の軟骨や骨等を使用することができる。また、本発明においては、一

度抽出されたコラーゲン含有物や市販のコラーゲンも本発明のコラーゲン源に含まれる。

【0025】ムコ多糖の原料であり、またコラーゲンの原料としても用いられる原料、例えばサメ軟骨を原料とし、本発明の抽出方法により抽出した場合、又はムコ多糖源、例えば市販のムコ多糖と、コラーゲン源、例えば市販のコラーゲンを混合して原料とし、本発明の抽出方法により抽出した場合、ムコ多糖及びコラーゲンの両方を含有する抽出物を得ることができる。これらも当然、本発明のムコ多糖及びコラーゲン含有抽出物に包含される。

【0026】抽出前の前処理は特に限定はないが、単なる水洗、焙炒、焙煎、蒸しを通常の方法に従って行ってもよく、後述のようにプロテアーゼ処理を行ってもよく、又これらを組み合わせて行うこともできる。前処理後のムコ多糖源の形状としては特に限定はないが、粉状、フレーク状、細片、薄片、角切りまたはそのままで使用すればよい。

【0027】本発明に用いる還元性物質は、特に限定はないが、食用に供されるものが好ましく、還元の効果や味に及ぼす影響からアスコルビン酸、アスコルビン酸塩、エリソルビン酸、エリソルビン酸塩、システイン及びグルタチオンの群から選ばれる1つ以上を使用することが好適である。ここで、アスコルビン酸塩及びエリソルビン酸塩はナトリウム、カリウム、カルシウム等の塩であればよい。使用する還元性物質の量は、抽出に用いる液に対して0.005～5.0%w/w、好ましくは0.01～2.0%w/wである。

【0028】また、ムコ多糖源及び／又はコラーゲン源からの抽出においてプロテアーゼを使用する場合は、前述のように前処理としてあらかじめプロテアーゼ処理したムコ多糖源及び／又はコラーゲン源を還元性物質存在下で熱水又は溶剤抽出する方法、又はムコ多糖源及び／又はコラーゲン源を還元性物質存在下でプロテアーゼ処理しながら熱水又は溶剤抽出する方法、またはこれらを組み合わせた方法のいずれの方法を採用することもでき、当該方法により、タンパク質の低減又は除去された新規なムコ多糖及び／又はコラーゲン含有抽出物、ムコ多糖及び／又はコラーゲンを得ることができる。

【0029】タンパク質の低減又は除去された本発明のムコ多糖及び／又はコラーゲン含有抽出物、ムコ多糖及び／又はコラーゲンは、ムコ多糖源及び／又はコラーゲン由来の不快臭、及び抽出処理工程由来の臭い成分や着色成分が低減又は除去され、さらにタンパク質も低減又は除去されており、原料素材として他の混合物の香味を崩すことがなく、食品、飲料、調味料、飼料、化粧料又は医薬の素材としても特に有用である。またこのようなタンパク質含量の低減されたムコ多糖及び／又はコラーゲン含有抽出物、ムコ多糖及び／又はコラーゲンは、

ことからアレルギー反応を回避させた食品、飲料、調味料、飼料、化粧料又は医薬の素材としても特に有用である。

【0030】プロテアーゼ処理に用いるプロテアーゼは特に限定はなく、動物、植物及び微生物起源のものが使用でき、例えば、動物起源のものとして、キモトリプシン、トリプシン、ペプシン又はキモシンが挙げられ、植物起源のものとして、パバイン又はプロメラインが挙げられ、微生物起源のものとして、細菌、放線菌、麹菌、カビ又は担子菌の酸性、中性及びアルカリ性プロテアーゼが挙げられる。また、コラゲナーゼ、エステラーゼ及びケラチナーゼもここでいうプロテアーゼに包含され、製造する抽出物やムコ多糖及び／又はコラーゲンの種類によりこれらのプロテアーゼを選択して使用することができる。また、カルボキシペプチダーゼ、アミノペプチダーゼ、リパーゼ、グルコアミラーゼ、 α -アミラーゼ、ヘクチナーゼ、セルラーゼ、ヘミセルラーゼの少なくとも一つ以上とプロテアーゼを併用してもよい。

【0031】ムコ多糖源及び／又はコラーゲン源を前処理としてプロテアーゼ処理する場合、プロテアーゼの使用量は特に限定はないが、使用するムコ多糖源及び／又はコラーゲン源乾物あたり0.01～10%w/w、好ましくは0.05～5%w/wである。溶媒は、酵素が作用できるものであれば特に限定はないが、目的の本発明のムコ多糖及び／又はコラーゲン含有抽出物、ムコ多糖及び／又はコラーゲンによって、ムコ多糖、コラーゲンの溶解度等の性質に合わせて適宜選択され、例えば水又はエチルアルコール水溶液（エチルアルコール濃度、0～50%v/v）が好適に使用できる。また、作用温度は、使用酵素によって特に限定はなく、30～120℃であるが、作業上50～100℃が好ましい。反応時間は、反応温度によって適宜設定できるが、0.1～32時間、好ましくは0.2～24時間である。

【0032】本発明の抽出条件は、抽出に用いる液とムコ多糖源及び／又はコラーゲン源の合計重量に対するムコ多糖源及び／又はコラーゲン源の重量は、0.5～50%w/w未満、香味の点からは1～20%w/wである。尚、0.5～50%w/wの範囲で抽出後、濃縮して濃度を上昇させて使用することもでき、又粉末化してもよい。更に、希釈して用いてもよい。抽出に用いる溶媒は特に限定はなく、可飲のもの、無毒であればよい。例えば、水又は溶剤が適宜使用できる。溶剤としては有機及び無機のものを使用でき、目的の本発明のムコ多糖及び／又はコラーゲン含有抽出物、ムコ多糖及び／又はコラーゲンによって、ムコ多糖、コラーゲンの溶解度等の性質に合わせて適宜選択され、例えばエチルアルコールやエチルアルコール水溶液等が使用できる。また、超臨界抽出としては炭酸ガス等が挙げられる。取り扱いの容易性からは水溶液が好適に使用できる。抽出に用いる水は特に限定はなく、飲用に供されるものであれば良い

が、脱塩水、蒸留水が好ましい。

【0033】また前述したように、抽出過程においてプロテアーゼを添加し、プロテアーゼ処理をしながら抽出を行うことができる。この際のプロテアーゼの使用量は特に限定はないが、使用ムコ多糖源及び／又はコラーゲン源乾物あたり0.01～10%w/w、好ましくは0.05～5%w/wである。

【0034】抽出方法は特に限定はないが、温水浸漬法、温水散水法、温水循環法を好適に用いることができる。抽出温度は30℃超～130℃、好ましくは抽出効率の上からは50～100℃である。抽出時間は5分超～32時間、好ましくは0.2～24時間である。このときの抽出液のpHは3～8が好適である。抽出後のpHは4～7前後が保存と香味保持の上から好ましい。固液分離は特に限定しないが、通常の濾別、遠心分離、または籠状の金網中に入れ抽出後回収することもできる。固液分離後の精製は、抽出液に可溶化している高分子成分を低温下（10℃以下0℃以上）で冷却し濾過することにより、又は必要に応じてはこれら成分を常法の柿渋及び滓下げ剤を用いて凝集、沈澱させ、濾過することにより、清澄な液を得ることができる。濾過は好ましくは1μmφ又は0.45μmφのフィルターを用いて濾過すると良い。

【0035】本発明により得られたムコ多糖及び／又はコラーゲン含有抽出物（以下、本発明の抽出物と称することがある）、ムコ多糖及び／又はコラーゲンは、120℃、20秒間殺菌加熱後、濃縮、そのまま／又は水で希釈してさらに無菌濾過して容器へ充填して製品とすることができる。この時窒素ガス充填を行ってもよく、その後90℃、1分間加熱殺菌して製品とすることができる。

【0036】本発明の抽出物の形状としては、特に限定はないが、液状、乾燥物等の固形状、粉末状でも良い。

【0037】また、本発明の抽出物から公知の高分子成分の分離方法を施すことによっても、ムコ多糖及び／又はコラーゲンを分離することができる。

【0038】本発明の製造方法により得られるムコ多糖としては、動物由来の粘性分泌物から得られた多糖であればとくに限定はなく、各種グリコサミノグリカンやキチン、キトサン等が例示され、グリコサミノグリカンとしては、ヒアルロン酸、コンドロイチン硫酸、コンドロイチン、ケラタン硫酸Ⅰ及びⅡ、ヘパリン、ヘパラン硫酸およびデルマタン硫酸が例示され、特に好適にはコンドロイチン硫酸が例示される。また得られたムコ多糖としては、これらのムコ多糖の混合物であってもよい。

【0039】得られた本発明の抽出物、ムコ多糖及び／又はコラーゲンを含有する食品、飲料又は調味料は、必要に応じ、甘味料、酸味料、香料等を添加しても良く、還元剤を追加して添加しても良い。また、例えば当該飲料にはエチルアルコール1～10%v/vを添加し、本

発明の抽出物、ムコ多糖及び／又はコラーゲン含有アルコール飲料としても良い。更に炭酸ガスを入れて炭酸ガス入り本発明の抽出物、ムコ多糖及び／又はコラーゲン含有アルコール飲料もできる。また、本発明の抽出物、ムコ多糖及び／又はコラーゲンは濃縮液又は粉末にして、食品や他の食料にも使用できる。

【0040】本発明の食品、飲料又は調味料としては本発明の抽出物、ムコ多糖及び／又はコラーゲンを含有すれば良く、本発明の抽出物、ムコ多糖及び／又はコラーゲンを含有、添加及び／又は希釈してなる食品、飲料又は調味料である。また、本発明の食品、飲料又は調味料に含有される本発明の抽出物、ムコ多糖及び／又はコラーゲンの量には特に限定はないが、本発明の抽出物、ムコ多糖及び／又はコラーゲンを0.001%w/wから90%w/w含有する食品、飲料又は調味料が例示される。

【0041】なお、本発明の食品、飲料、調味料、後述の飼料又は化粧料にいう「含有」の語は、含有、添加、希釈の意を含むものであり、含有とは食品、飲料、調味料、飼料又は化粧料中に本発明で使用する有効成分が含まれるという態様を、添加とは食品、飲料、調味料、飼料又は化粧料の原料に、本発明で使用する有効成分を添加するという態様を、希釈とは本発明で使用する有効成分を、食品、飲料、調味料、飼料又は化粧料の原料で希釈するという態様をいうものである。

【0042】本発明の食品、飲料又は調味料とは、本発明の抽出物、ムコ多糖及び／又はコラーゲンを含有すれば良く、特に限定はないが、例えば穀物加工品（小麦粉加工品、でんぷん類加工品、プレミックス加工品、麺類、マカロニ類、パン類、あん類、そば類、麩、ビーフン、はるさめ、包装餅等）、油脂加工品（可塑性油脂、てんぷら油、サラダ油、マヨネーズ類、ドレッシング等）、大豆加工品（豆腐類、味噌、納豆等）、食肉加工品（ハム、ベーコン、プレスハム、ソーセージ等）、水産製品（冷凍すり身、かまぼこ、ちくわ、はんぺん、さつま揚げ、つみれ、すじ、魚肉ハム、ソーセージ、かつお節、魚卵加工品、水産缶詰、つくだ煮等）、乳製品（原料乳、クリーム、ヨーグルト、バター、チーズ、練乳、粉乳、アイスクリーム等）、野菜・果実加工品（ペースト類、ジャム類、漬け物類、果実飲料、野菜飲料、ミックス飲料等）、菓子類（チョコレート、ビスケット類、菓子パン類、ケーキ、餅菓子、米菓類、キャンディー等）、アルコール飲料（日本酒、中国酒、ワイン、ウイスキー、焼酎、ウオッカ、ブランデー、ジン、ラム酒、ビール、清涼アルコール飲料、果実酒、リキュール等）、嗜好飲料（緑茶、紅茶、ウーロン茶、コーヒー、清涼飲料、乳酸飲料等）、調味料（しょうゆ、ソース、酢、みりん、ドレッシングタイプ調味料等）、缶詰め・瓶詰め・袋詰め食品（牛飯、釜飯、赤飯、カレー、その他の各種調理済み食品）、半乾燥又は濃縮食品（レバー

ペースト、その他のスプレッド、そば・うどんの汁、濃縮スープ類等)、乾燥食品(即席麺類、即席カレー、インスタントコーヒー、粉末ジュース、粉末スープ、即席味噌汁、調理済み食品、調理済み飲料、調理済みスープ等)、冷凍食品(すき焼き、茶碗蒸し、うなぎかば焼き、ハンバーグステーキ、シュウマイ、餃子、各種スティック、フルーツカクテル等)、固形食品・液体食品(スープ等)、香辛料等の農産・林産加工品、畜産加工品、水産加工品等が挙げられる。

【0043】本発明の食品、飲料又は調味料を製造する方法は、特に限定はないが、調理、加工及び一般に用いられている食品、飲料又は調味料の製造法による製造を挙げることができ、製造された食品、飲料又は調味料に本発明の抽出物、ムコ多糖及び／又はコラーゲンが含有されていれば良い。

【0044】調理及び加工においては、調理・加工前、調理・加工時、更には調理・加工後に本発明の抽出物、ムコ多糖及び／又はコラーゲンを添加しても良いし、調理及び加工品やその材料を本発明の抽出物、ムコ多糖及び／又はコラーゲンへ添加し、本発明の抽出物、ムコ多糖及び／又はコラーゲンを希釈しても良い。食品、飲料又は調味料の製造においては、任意の工程で、本発明の抽出物、ムコ多糖及び／又はコラーゲンを添加しても良いし、食品、飲料又は調味料、並びにその原料を本発明の抽出物、ムコ多糖及び／又はコラーゲンへ添加し、本発明の抽出物、ムコ多糖及び／又はコラーゲンを希釈し、食品、飲料又は調味料に含有させても良い。また、添加は1回又は数回に渡って行っても良い。従って、簡単に新規な食品、飲料又は調味料、即ち有効量の本発明の抽出物、ムコ多糖及び／又はコラーゲンを含有する食品、飲料又は調味料を製造することができる。いずれの工程を経た場合も、本発明の抽出物、ムコ多糖及び／又はコラーゲンを含有、添加及び／又は希釈してなる食品、飲料又は調味料は、本発明の食品、飲料及び調味料と定義される。

【0045】また、本発明の抽出物、ムコ多糖及び／又はコラーゲンを公知の方法で造粒して粒状とし、本発明の食品とすることもできる。

【0046】また、本発明により、本発明の抽出物、ムコ多糖及び／又はコラーゲンを含有、添加及び／又は希釈してなる生物用飼料が提供される。また本発明により、本発明の抽出物、ムコ多糖及び／又はコラーゲンを生物に投与することを特徴とする生物の飼育方法が提供される。また本発明により、本発明の抽出物、ムコ多糖及び／又はコラーゲンを含有することを特徴とする生物飼育用剤が提供される。

【0047】これらの発明において、生物とは例えば養殖動物、ペット動物等であり、養殖動物としては家畜、実験動物、家禽、魚類、甲殻類又は貝類が例示される。飼料としては体調の維持及び／又は改善用飼料が例示さ

れる。生物飼育用剤としては浸漬用剤、飼料添加剤、飲料用添加剤が例示される。

【0048】本発明の抽出物、ムコ多糖及び／又はコラーゲンは通常、対象生物の体重1kg、1日当たり0.01~2000mg投与され、人工配合飼料の原料中に添加混合させるか、人工配合飼料の粉末原料と混合した後、その他の原料に添加混合させることができる。本発明の抽出物、ムコ多糖及び／又はコラーゲンの対象生物用飼料中の含有量は特に限定はなく、目的に応じて使用すれば良いが、0.001~15w/w%の割合が適当である。

【0049】人工配合飼料としては、魚粉、カゼイン、イカミールなどの動物性原料、大豆粕、小麦粉、デンプン、飼料用酵母などの植物性原料、タラ肝油、イカ肝油、などの動物性油脂、大豆油、菜種油等の植物性油脂、ビタミン類、ミネラル類、アミノ酸、抗酸化剤等を原料とする人工配合飼料が挙げられる。また魚肉ミンチ等の魚類用飼料が挙げられる。

【0050】本発明の飼料の製造方法に特に限定は無く、製造された飼料中に本発明の抽出物、ムコ多糖及び／又はコラーゲンの有効量が含有、添加及び／又は希釈されていればよい。

【0051】また本発明の抽出物、ムコ多糖及び／又はコラーゲンをプール、水槽、保持タンク又は飼育領域の水、海水等に直接、添加し、対象生物を浸漬することにより、投与することもできる。この浸漬方法は対象生物の飼料摂取量が低下したときに特に有効である。水又は海水中の本発明の抽出物、ムコ多糖及び／又はコラーゲンの濃度は特に限定はなく、目的に応じて使用すれば良いが、0.00001~1w/w%の割合が適当である。

【0052】また本発明の抽出物、ムコ多糖及び／又はコラーゲンを含有する飲料を飼育用飲料として対象生物に摂取させても良い。飲料中の本発明の抽出物、ムコ多糖及び／又はコラーゲンの濃度は特に限定はなく、目的に応じて使用すれば良いが、0.0001~1w/w%の割合が適当である。本発明の抽出物、ムコ多糖及び／又はコラーゲンを有効成分とする飼育用剤、例えば浸漬用剤、飼料添加剤、飲料用添加剤はそれ自体公知の方法で作製すれば良い。

【0053】本発明が適用できる生物としては限定は無いが、養殖動物としては、馬、牛、豚、羊、山羊、らくだ、ラマ等の家畜、マウス、ラット、モルモット、ウサギ等の実験動物、鶏、アヒル、七面鳥、鴨鳥等の家禽、マダイ、イシダイ、ヒラメ、カレイ、ブリ、ハマチ、ヒラマサ、マグロ、シマアジ、アユ、サケ・マス類、トラフグ、ウナギ、ドジョウ、ナマズ等の魚類、クルマエビ、ブラックタイガー、タイショウエビ、ガザミ等の甲殻類等、アワビ、サザエ、ホタテ貝、カキ等の貝類、ペット動物としてはイヌ、ネコ等が挙げられ、陸上・水中

動物に広く適用できる。

【0054】本発明の抽出物、ムコ多糖及び／又はコラーゲンを含有する飼料を摂取させること、又は本発明の抽出物、ムコ多糖及び／又はコラーゲンの含有液に対象生物を浸漬することにより、家畜、実験動物、家禽、魚類、甲殻類、貝類、ペット動物等の体調を良好に維持したり改善したりすることができる。

【0055】本発明の食品、飲料、調味料又は飼料としては、本発明の抽出物、ムコ多糖及び／又はコラーゲンが含有、添加及び／又は希釈されており、その生理機能を発現するための必要量が含有されていれば特にその形状に限定は無く、タブレット状、顆粒状、カプセル状等の経口的に摂取可能な形状物も包含する。なお、本発明の抽出物、ムコ多糖及び／又はコラーゲンは、健康食品素材として、食品、飲料、調味料または飼料の製造素材として極めて有用である。さらに、本発明の抽出物、ムコ多糖及び／又はコラーゲンは、従来のムコ多糖含有抽出物やムコ多糖、コラーゲンと比較しても原料由来からの不快臭が低減され、色調もよく、これらの点からも食品、飲料、調味料又は飼料の素材として極めて有用である。

【0056】本発明の抽出物、ムコ多糖及び／又はコラーゲンを有効成分として含有する医薬（以下、本発明の医薬と称することがある）としては、本発明の抽出物、ムコ多糖及び／又はコラーゲンを有効成分として含有していれば特に限定はないが、ムコ多糖及びコラーゲンが有する公知の生理機能、例えばコンドロイチン硫酸の有する生理機能としては関節組織の円滑化、脂血清化作用、血液凝固阻止作用、コラーゲンが有する生理機能としては、皮膚の保湿、新陳代謝の活性化、免疫賦活作用を利用した医薬が挙げられる。

【0057】本発明で使用する抽出物、ムコ多糖及び／又はコラーゲンは、さまざまな生理機能を有しており、本発明の抽出物、ムコ多糖及び／又はコラーゲンを有効成分として医薬を製造することができる。

【0058】本発明の医薬は、本発明の抽出物、ムコ多糖及び／又はコラーゲンを有効成分とし、これを公知の医薬用担体と組合せ製剤化すれば良い。当該製剤の製造は一般的には、本発明の抽出物、ムコ多糖及び／又はコラーゲンを薬学的に許容できる液状又は固体状の担体と配合し、かつ必要に応じて溶剤、分散剤、乳化剤、緩衝剤、安定剤、賦形剤、結合剤、崩壊剤、滑沢剤等を加えて、錠剤、顆粒剤、散剤、粉末剤、カプセル剤等の固形剤、通常液剤、懸濁剤、乳剤等の液剤とすることができる。またこれを使用前に適当な担体の添加によって液状となし得る乾燥品とすることができる。

【0059】医薬用担体は、上記投与形態及び剤型に応じて選択することができ、経口剤の場合は、例えばデンプン、乳糖、白糖、マンニット、カルボキシメチルセルロース、コーンスターチ、無機塩等が利用される。また

経口剤の調製に当っては、更に結合剤、崩壊剤、界面活性剤、潤沢剤、流動性促進剤、矯味剤、着色剤、香料等を配合することもできる。

【0060】一方、非経口剤の場合は、常法に従い本発明の抽出物、ムコ多糖及び／又はコラーゲンを、希釈剤としての注射用蒸留水、生理食塩水、ブドウ糖水溶液、注射用植物油、ゴマ油、ラッカセイ油、ダイズ油、トウモロコシ油、プロピレングリコール、ポリエチレングリコール等に溶解ないし懸濁させ、必要に応じ、殺菌剤、安定剤、等張化剤、無痛化剤等を加えることにより調製することができる。

【0061】本発明の医薬は、製剤形態に応じた適当な投与経路で投与することができる。投与方法も特に限定はなく、内用、外用及び注射にすることができる。注射剤は、例えば静脈内、筋肉内、皮下、皮内等に投与し得、外用剤には座剤等も包含される。

【0062】本発明の医薬の投与量は、その製剤形態、投与方法、使用目的及びこれに適用される患者の年齢、体重、症状によって適宜設定され、一定ではないが一般には製剤中に含有される本発明の抽出物、ムコ多糖及び／又はコラーゲンの量が成人1日当たり0.1～2000mg/kgである。もちろん投与量は、種々の条件によって変動するので、上記投与量より少ない量で十分な場合もあるし、あるいは範囲を超えて必要な場合もある。本発明の医薬はそのまま経口投与するほか、任意の飲食品に添加して日常的に摂取させることもできる。また本発明の抽出物、ムコ多糖及び／又はコラーゲンを有効成分として有する飲食品の原料として用いても良い。

【0063】次に、本発明の抽出物、ムコ多糖及び／又はコラーゲンを有効成分として含有することを特徴とする化粧料（以下、本発明の化粧料と称することがある）が提供される。本発明の化粧料により、ムコ多糖やコラーゲンが有する化粧料素材としての公知の生理作用、例えば皮膚の保湿性や弾力性の向上効果、皮膚の老化防止効果等の効果を得ることができる。

【0064】本発明の化粧料における本発明の抽出物、ムコ多糖及び／又はコラーゲンの含有量は通常好ましくは0.0001～20%w/w、より好ましくは0.001～5%w/wである。

【0065】本発明の化粧料は公知の配合に準じて常法に従って製造することができる。本発明の化粧料としては、例えばローション類、乳液類、クリーム類、パック類、浴用剤、洗顔剤、浴用石ケン又は浴用洗剤等を包含するものである。本発明の化粧料を、それぞれの用途形態に応じて所望の量、例えばローション類であれば、例えばヒトの顔面全体に適用するような場合、1回の使用当たり好ましくは0.01～5g、より好ましくは0.1～2g程度を用いれば、肌に張りや艶を与え、美肌効果が得られるという本発明の所望の効果が得られる。

【0066】本発明に使用するムコ多糖及び／又はコラ

ーゲン含有抽出物、ムコ多糖及び／又はコラーゲンはラットへの経口投与において1g/kgを経口単回投与しても死亡例は認められない。

【0067】

【実施例】以下、本発明を実施例により、更に具体的に説明するが、本発明はこれら実施例に限定されない。

【0068】実施例1

サメ軟骨（透明部）の乾燥物500gを流水中に浸した後、水を切り、これに井水1リットルと市販の細菌性タンパク分解酵素（ビオブラーゼSP-60、ナガセ生化学工業社製）3gを加え、pH6.6、55℃で5時間消化した。このとき本発明品には、還元剤としてアスコルビン酸ナトリウムを、使用する井水1リットルに対し、0.001、0.01、0.1、1.0および5%w/v添加した。対照はアスコルビン酸ナトリウム無添加とした。消化後、ほとんど液化したこの分解物をろ紙濾過して得たそれぞれの濾液2.2リットルに対し、エチルアルコール（95.5%v/v）10リットルを加え、5℃で静置して沈澱を析出させ、デカンテーションおよび遠心分離（3000回転/分）して沈澱物を回収し、常法により乾燥し、風乾物を得、サメ軟骨抽出物とした。得られたサメ軟骨抽出物（75.0±2.0g）は、いずれも水分10±1%w/w、ムコ多糖等54±1%w/w、およびタンパク質量36±1%w/wであった。20℃の蒸留水を用いてこれらの風乾物の溶液を*

表1

| | 本発明品 | | 対照 |
|-----------------------------|-------|-------|------|
| | No. 1 | No. 2 | |
| 市販のムコ多糖(%w/w) | 12 | 12 | 12 |
| アスコルビン酸Na(%w/v) | 0.3 | 0.3 | 0 |
| プロテアーゼ製剤* | | | |
| パパイン (植物起源 %w/v) | 0.24 | 0.24 | 0.24 |
| ビオブラーゼSP-60 (微生物起源 %w/v) | 0.24 | 0 | 0 |
| 蒸留水 | 残余 | 残余 | 残余 |

*: ナガセ生化学工業製

【0071】抽出反応は、60℃で12時間、さらに80℃で1時間行った後、抽出反応物をセルロースチューブに入れ、蒸留水に対し、5℃で24時間透析した。透析期間中に蒸留水を3～4回交換した。この透析液を常法に従い、透析前のもとの容量になるように濃縮して凍結乾燥し、それぞれの凍結乾燥品を得た。本発明品No. 1は、25g（水分1.0%w/w、タンパク質9.0%w/w）、本発明品No. 2は、27g（水分1.0%w/w、タンパク質15.0%w/w）および対照品は29g（水分1.0%w/w、タンパク質20

*調製し、同じ20℃の蒸留水から調製した対照品の1%w/v溶液と比較して同等強度の臭いのするこれらの風乾物の溶液の濃度を、5名のパネルメンバーにより官能的に求めたところ、添加したアスコルビン酸ナトリウムが0.001、0.01、0.1、1.0および5%w/vの場合で、5人の平均値からそれぞれ1.4%w/v、1.5%w/v、1.9%w/v、2.1%w/vおよび1.8%w/vに対応した。臭いの減少率を（1-対照品の濃度/本発明品の濃度）×100（%）で表現すると、それぞれ28.5%、33.3%、47.4%、52.3%および44.4%であった。したがって、還元条件下で酵素処理する本発明品は、明らかに臭いが低減されており、着色も少ない傾向にあった。また、還元剤であるアスコルビン酸ナトリウムの濃度は、0.001～5.0%w/vの範囲では20%以上の臭いの減少を示し、0.01～5%w/vの範囲では30%以上の臭いの減少を示すので、この範囲の還元剤の使用が好適であることがわかった。

【0069】実施例2

市販のムコ多糖（サメ由来食品用コンドロイチン；ムコ多糖40%w/w、タンパク質40%w/w）を用い、表1に示す配合で、300mlのスケールで抽出反応を行った。

【0070】

【表1】

%w/w)で回収され、ムコ多糖の減少は認められず、本発明品のムコ多糖含量比は向上した。

【0072】実施例1と同様にして、20℃の蒸留水を用いて、対照品の1%w/v溶液を調製し、それと同等強度の臭いのする濃度の溶液を本発明の凍結乾燥品で調製した。評価は、5名のパネルメンバーで求め、その平均値で行った。その結果、本発明品No. 1は、5.5%w/vおよび本発明品No. 2は3.7%w/v濃度で対照品の溶液と同等の強度の臭いに相当し、臭いの減少率はそれぞれ81.8%および73.0%となり、ム

コ多糖源由来の臭いが著しく減少した。また、抽出物の着色も、本発明品は対照品の淡黄色に比べ白色に近づき、食品素材として臭いおよび着色が軽減されており、品質が向上した。このように、本発明品は、使用の際に余分の臭いや着色を付加することがないので、使用用途がさらに広がると期待できる。

【0073】実施例3

市販のコラーゲン（牛由来、非水溶性）200gを、10%v/vエチルアルコール水溶液1リットルに懸濁し、本発明品には10%v/vアルコール水溶液中に還元剤としてアスコルビン酸Naを0.1%w/vになるように添加した。対照は還元剤無添加とした。それぞれ、55℃で6時間処理後、遠心機（3000回転/分）で固液分離後、風乾して、水分14%w/wの処理物を得た。実施例1と同様にして、20℃の蒸留水を用*

表2 ムコ多糖含有飲料

| | 本発明品 (%w/v) | 対照品 (%w/v) |
|--------------------------------------|----------------|---------------|
| 還元剤処理サメ軟骨抽出物 (0.1%w/vアスコルビン酸Na処理) | 2 | 0 |
| 還元剤無処理サメ軟骨抽出物 | 0 | 2 |
| トレハロース | 2.5 | 2.5 |
| 1/5 リンゴ果汁 | 1.7 | 1.7 |
| 1/5 レモン果汁 | 0.13 | 0.13 |
| アスコルビン酸 | 0.04 | 0.04 |
| pH* | 4.0 | 4.0 |
| 酸度 0.1N NaOH ml/20ml | 3.72 | 3.72 |
| ブリークス | 5.5 | 5.5 |

*pHはクエン酸で調整

【0076】表2の配合により得られた、それぞれの飲料は200ml容器に充填し、115℃で15分間加熱殺菌し、缶詰品を調製した。官能評価は、パネルメンバーは10名で、5段階評価（1良～5悪）を用い、平均※

表3 官能評価

| | 本発明品 | 対照品 |
|----|------|-----|
| 味 | 2.7 | 3.2 |
| 香り | 2.5 | 3.2 |
| 色調 | 2.7 | 2.9 |
| 総合 | 2.6 | 3.1 |

【0078】表3より、本発明品の還元剤処理サメ軟骨抽出物を用いた飲料は、対照品に比べ、原料由来の臭いがなく、甘味、酸味及び旨味のバランスがよく、後味がすっきりして新規な香味のムコ多糖含有の飲料となった。対照品は、サメ軟骨由来の不愉快臭がきつく、香味バランスがくずれ、後味も悪かった。また、本発明品は対

※いて、対照の2%w/v溶液を調製し、それと同等強度の臭いのするの濃度の溶液を本発明品で調製した。評価は、5名のパネルメンバーで求め、その平均値で行った。その結果、本発明品は、5.2%w/v濃度で対照と同等の強度の臭いに相当し、臭いの減少率は61.5%となり、コラーゲン由来の臭いが著しく減少した。また、処理物の着色も本発明品は対照の淡黄色に比べて白色に近づき、食品素材として臭いおよび着色が軽減され、さらに品質向上した。

【0074】実施例4

実施例1の本発明品及び対照のサメ軟骨抽出物を用いて、表2に示す配合表のムコ多糖含有飲料を調製した。

【0075】

【表2】

※値を求めた。その結果を表3に示す。

【0077】

【表3】

照品に比べて色調も良好であった。

【0079】実施例5

実施例1のサメ軟骨抽出物を用いたスープを調製した。本発明品は還元剤処理したサメ軟骨抽出物（アスコルビン酸Na、0.1%w/v）、対照には無処理のものを用いた。表4にムコ多糖入りスープの配合を示す。この

配合に従って、スープを調製し、200ml缶に充填して120℃、15分間加熱殺菌を行い、缶詰品とした。官能評価は、パネルメンバーは10名で、5段階評価（1良～5悪）を用い、平均値を求めた。その結果を表*

*5に示す。
【0080】
【表4】

表4 ムコ多糖入りスープの配合

| | 本発明品 (%) | 対照品 (%) |
|--|----------|---------|
| 還元剤処理サメ軟骨抽出物 (0.1%w/v アスコルビン酸Na 処理) | 4 | 0 |
| 還元剤無処理サメ軟骨抽出物 | 0 | 4 |
| 低強度寒天* | 0.25 | 0.25 |
| 乳清ミネラル | 0.60 | 0.60 |
| ポークエキス | 0.13 | 0.13 |
| 砂糖 | 0.10 | 0.10 |
| 胡椒 | 0.0005 | 0.0005 |
| アスコルビン酸 | 0.02 | 0.02 |
| pH | 5.0 | 5.0 |

*伊那食品工業社製

pHはクエン酸又はクエン酸ナトリウムで調整

【0081】

※ ※【表5】

表5 官能評価

| スープ | 項目 | | | 総合 |
|------|-----|-----|-----|-----|
| | 味 | 香り | 色調 | |
| 本発明品 | 2.8 | 2.5 | 3.0 | 2.8 |
| 対照品 | 3.5 | 3.8 | 3.5 | 3.6 |

【0082】表5より、本発明品は対照に比べて後味がよく、スッキリした味に仕上がりが、サメ軟骨抽出物がポークエキスの香味を引き立たせ、全体の香味バランスを整えた。対照はサメ軟骨由来の臭いが残り、ポークエキスと調和がくずれ、香味全体のバランスをくずす傾向にあった。このように、調理の面から見て、本発明品のサメ軟骨抽出物は、その香味の特性から調味料として優れていることが明らかとなった。また、色調も、本発明品は対照品に比べて良好であった。

【0083】実施例6

ふりかけとして魚粉2.4kg、食塩0.5kg、グルタミン酸ソーダ0.3kgを混合（計3.2kg）し、本発明品及び対照として実施例1で得られたサメ軟骨抽出物の凍結乾燥品を上記ふりかけ1kg当たり5gをそれぞれ添加し、及び無添加で常法に従って造粒した。これらそれぞれの造粒品約3.2kgに対してこま1.2kgをよく混合して調製した。これらのふりかけを米飯

にふりかけ、官能評価を実施例4と同様にして行った。その結果、本発明品は対照に比べ、魚粉やゴマの香味時に旨味調和し、隠し味として機能を有することがわかった。対照はサメ軟骨由来の不快臭がわずかに残り、魚粉及びゴマの香りのバランスをくずし、また、苦味が口にわずかに残った。本発明品は総合して、ふりかけの品質を向上させることが分かった。

【0084】実施例7

表6の配合で、打錠機を用い、打錠時の圧力3000kg/cm²で常法に従い錠菓を作成した。本発明品には、実施例1で得られた還元剤処理サメ軟骨抽出物を用い、対照は実施例1で得られた対照のサメ軟骨抽出物を用いた。その結果、本発明品は、口に含んだときサメ軟骨由来の不快臭が無く、全体の味のバランスが向上し、舌触りが滑らかであった。

【0085】

【表6】

表6 配合表

| | 本発明品 | 対照品 |
|---|------|-----|
| 還元剤処理サメ軟骨抽出物 (mg) (0.1%w/v アスコルビン酸Na 処理) | 100 | 0 |
| 還元剤無処理サメ軟骨抽出物 (mg) | 0 | 100 |
| デキストリン (mg) | 100 | 100 |
| 還元麦芽糖水飴 (mg) | 715 | 715 |
| 乳糖 (mg) | 223 | 223 |
| カカオパウダー (mg) | 78 | 78 |
| 香料 (mg) | 19 | 19 |
| シヨ 糖脂肪酸エステル (mg) | 65 | 65 |

【0086】

【発明の効果】本発明により、低コストで、無色の、無臭化又は原料由来の不快感が低減された新規なムコ多糖及び／又はコラーゲン含有抽出物、ムコ多糖及び／又はコラーゲンの製造方法が提供される。また、当該製造方*

*法にプロテアーゼ処理を施すことにより、タンパク質含量の低減された新規なムコ多糖及び／又はコラーゲン含有抽出物が提供される。また本発明により、当該抽出物、ムコ多糖及び／又はコラーゲンを含有する食品、飲料、調味料、飼料、化粧品又は医薬も提供される。

フロントページの続き

| (51)Int.Cl. ⁷ | 識別記号 | F I | テーマコード(参考) |
|--------------------------|-------|---------|------------|
| A 2 3 L | 1/221 | A 2 3 L | 1/221 |
| | 1/305 | | 1/305 |
| | 1/308 | | 1/308 |
| | 2/52 | A 6 1 K | 7/00 |
| A 6 1 K | 7/00 | | 47/36 |
| | 47/36 | | 47/42 |
| | 47/42 | C 0 8 B | 37/00 |
| C 0 8 B | 37/00 | | 37/10 |
| | 37/10 | A 2 3 L | 2/00 |
| | | | F |

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F ターム(参考) 2B150 AA01 AA02 AA03 AA05 AA06
AA07 AA08 AA10 AA20 AB03
AB20 DC14 DC23 DD01
4B017 LC03 LK13 LK15
4B018 LB01 LB08 LB09 LB10 MD20
MD37 MD90 ME02 ME11
4B047 LB06 LB09 LF08 LF09 LF10
LG08 LG18 LG26 LP01 LP18
4C076 EE30 EE37 EE43 FF52
4C083 AD311 AD341 AD431 CC01
EE03 FF01
4C090 AA01 AA04 AA08 AA09 BA46
BA47 BA62 BA65 BA66 BA67
BA68 BC27 BC28 CA09 CA34
CA43 CA47 DA09 DA23 DA26